

OCT 26 1921

PROCEEDINGS
OF THE
AMERICAN SOCIETY
OF
CIVIL ENGINEERS

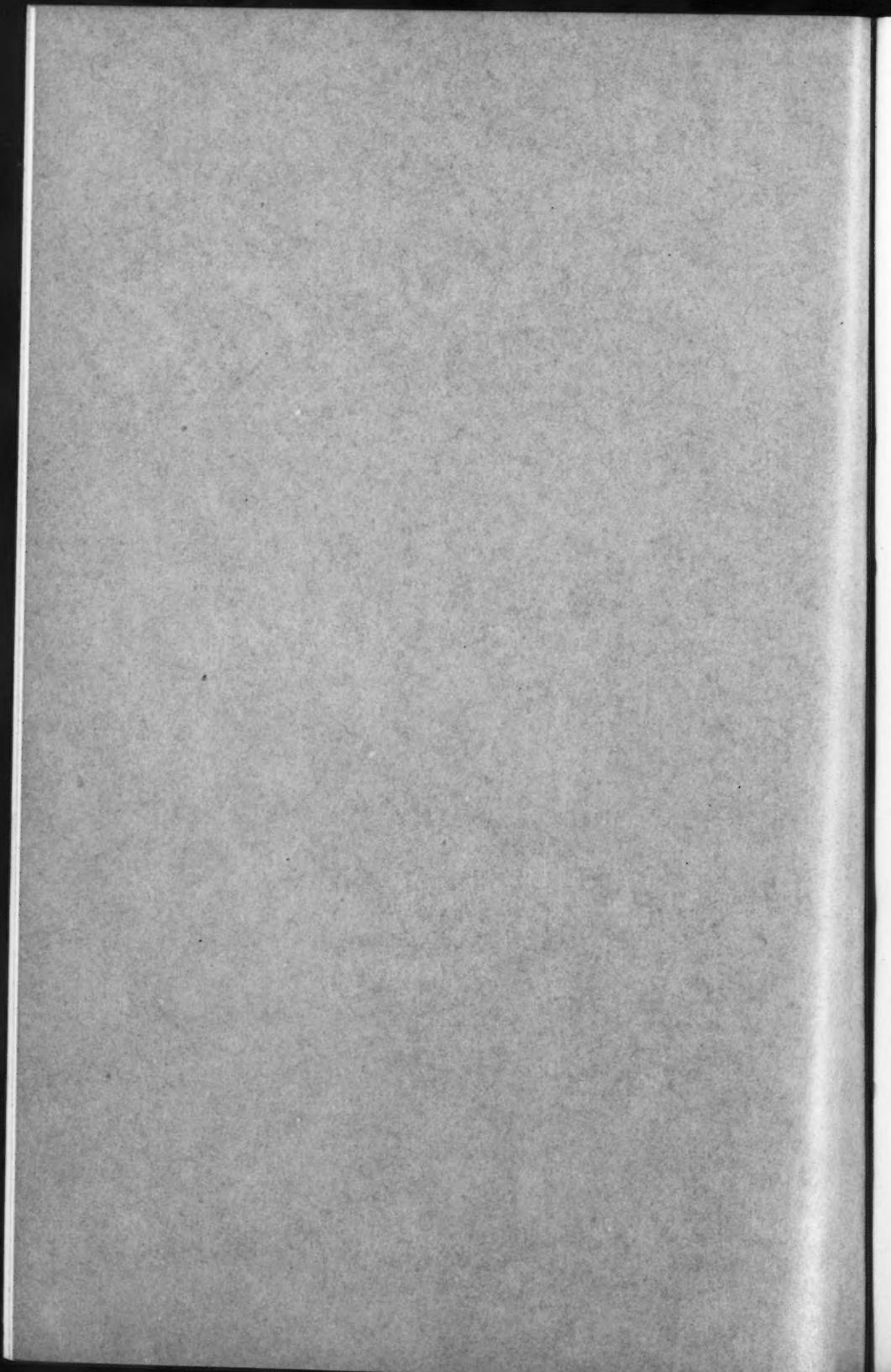
VOL. XLVII—No. 8



October, 1921

Published by the American Society of Civil Engineers at its Headquarters,
33 West Thirty-ninth Street, New York, the Fourth Wednesday
of each Month, except June and July.

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Entered as Second-Class Matter, December 14th, 1896, at the Post Office
at New York, N. Y., under the Act of March 3d, 1879.
Acceptance for mailing at special rate of postage provided for in Section 1103,
Act of October 3d, 1917, authorized on July 5th, 1918.
Subscription, \$8 per annum.



AMERICAN SOCIETY OF CIVIL ENGINEERS

INSTITUTED 1852

PROCEEDINGS

This Society is not responsible for any statement made or opinion expressed in its publications.

SOCIETY AFFAIRS

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MINUTES OF MEETINGS

OF THE SOCIETY

October 5th, 1921.—The meeting was called to order at 8 p. m.; President George S. Webster in the chair; Elbert M. Chandler, Acting Secretary; and present, also, 185 members and guests.

The minutes of the meetings of September 7th and 8th, 1921, were approved as printed in *Proceedings* for September, 1921.

President Webster announced that the polls on the ballot on the proposed revision of the Constitution were closed. The Acting Secretary announced that the President had appointed Messrs. William G. Grove, J. P. H. Perry, C. E. Beam, H. C. Hutchins, F. Leroy Stearns, and Thaddeus Merriman as Tellers to canvass the ballots on the proposed revision of the Constitution.

The Acting Secretary announced the election of the following candidates on September 12th, 1921:

AS MEMBERS

ARCHIE EDMUND BUMP, Boston, Mass.
WALTER LEAKE CLARKSON, Bayonne, N. J.
EARL FENNER CROASDALE, New York City
JOHN DYER, JR., Albany, N. Y.
ARTHUR CLARICO FREEMAN, JR., Oak Lane, Pa.
JOHN SMITH GOODMAN, Reading, Pa.
WILLIAM LAWRENCE ROSS HAINES, Pittsburgh, Pa.
HARRY VESTER JOHNSTON, San Francisco, Cal.
THOMAS EMMET LEAHY, Philadelphia, Pa.
FRANK REDMOND LEWIS, Forney, Tex.
JONTA BOEN MARCELLUS, Boulder, Colo.
CHARLES MARY MARDEL, Oakland, Cal.
CHARLES GOODWIN PATRICK, Eagle Rock, Cal.
VICTOR HERMAN REINEKING, Portland, Ore.
CHARLES ALFRED SMITH, Atlanta, Ga.
HUGH BURDETTE TABOR, Buenos Aires, Argentine Republic
ASHLEY JAY WELTON, Portland, Ore.
CURTIS CORNELIUS WESTFALL, Chicago, Ill.

AS ASSOCIATE MEMBERS

LYTTLETON COOKE ANDERSON, Nashville, Tenn.
ARTHUR GARFIELD BEARD, Omaha, Nebr.
RICHARD STOCKWELL BETTES, Springfield, Mass.
CARLOS MARIA BLANCO Y DE CASTRO, Saltillo, Coah., Mexico
THOMAS MELVILLE BRASSEL, New York City
JONATHAN BURDETTE BROWN, Sacramento, Cal.
THOMAS JAMES BUTLER, Barranquilla, Colombia
DAVID CLARK, Glasgow, Scotland
ARTHUR T. COOK, Santiago, Chile
ALGERNON CHARLES BRENNAN CRADDOCK, Shanghai, China
ANDREW ADAIR CUMMINS, Superior, Nebr.
JOHN ALOYSIUS DORMER, Minneapolis, Minn.
WALTER HENRY EVANS, St. Louis, Mo.
HAROLD STUART FISHER, Big Creek, Cal.
HARRY EDWIN FROST, Boston, Mass.
JOSEPH VAN METER FUNDERBURK, Morgantown, W. Va.
FRANK GARDNER, Apache, Okla.
HERBERT JAMES GILKEY, Urbana, Ill.
RICHARD TUGGLE GOODWYN, JR., Athens, Ga.
RALPH CHASE GRAHAM, Davenport, Iowa
GILBERT RAYMOND HARR, Indianapolis, Ind.
THOMAS DEVIN HARRIS, Albemarle, N. C.
CARTER HARRELL HARRISON, Dallas, Tex.

MACK ELLIOTT HAWORTH, Pittsburgh, Pa.
ARTHUR ELLIS HEAGLER, Paragould, Ark.
EDWIN CHARLES HOLBROOK, Boston, Mass.
JOHN DANIEL JOHNSON, Fort Worth, Tex.
HOWARD BUZBY KEASBEY, Salem, N. J.
GILBERT MICHAEL KILCARR, New York City
PHILIP WOODBRIDGE KNIGHTS, El Centro, Cal.
HARRY LINDSEY, Helena, Mont.
FLINT McGREGOR, El Paso, Tex.
WILLIAM COLEMAN MCNOWN, Lawrence, Kans.
ARTHUR LOUIS LIPPARD MARTIN, Brooklyn, N. Y.
WARD BYRON MAURER, St. Louis, Mo.
WALTER LLEWELLYN MORGAN, Spokane, Wash.
WILLIAM CANON MULDROW, Manson, Wash.
ELMO NEIL MURPHY, Cassel, Cal.
NELS PETER NELSON, Casper, Wyo.
ARTHUR BURDETTE OVERLAND, Austin, Minn.
JOHN HART PORTER, St. Louis, Mo.
FRANK ERWIN RICHART, Urbana, Ill.
GERALD STAATS RINEHART, New York City
JAMES HAZEN RIPLEY, New York City
CHARLES WILLIAM SCHIMMELPFENNIG, Booneville, Ind.
CHARLES SHAW, Gulfport, Miss.
CHARLES ELONZO SLOAN, Baltimore, Md.
RAY REED SMITH, San Francisco, Cal.
FRANCIS BENJAMIN STEWART, Kahoko, Mo.
FRED JAMES STEWART, Centreville, Iowa
NOYCE WORSTALL STRAIT, Pontiac, Mich.
CLIFFORD LINWOOD WADE, New Bedford, Mass.
STEPHEN KNIGHT WHIPPLE, San Mateo, Cal.
MAURICE EUGENE WORRELL, Hillsboro, Tex.

AS JUNIORS

STEVEN ROSS BERKE, Boston, Mass.
ROY FRAZIN BOWKER, Charlotte, N. C.
SIDNEY SILVEY GORMAN, San Francisco, Cal.
LELAND MONROE MOWER, Seattle, Wash.
WILLIAM DARYL PATTERSON, Norfolk, Va.
LOUIS FRANCIS QUIRK, Middletown, Conn.
EDWIN BERNARD RIDER, Baltimore, Md.
BENJAMIN HAINES RIGG, Washington, D. C.
HAROLD ARTHUR VICKER, State College, Pa.
CHARLES RUSCHENBERGER WENTWORTH, Roanoke, Va.
PERCY SUYDAM WILSON, Glen Ridge, N. J.

The Acting Secretary announced the transfer of the following candidates on September 12th, 1921:

FROM ASSOCIATE MEMBER TO MEMBER

FRANK WILLIS AUSTIN, Chanute, Kans.
ARTHUR FREDERICK BLIGHT, Big Creek, Cal.
TAZEWELL ELLETT, Richmond, Va.
ALLAN VAUGHN ELSTON, Springfield, Mo.
OZRO NOWLIN FLOYD, Vandalia, Ohio
JOHN ALDEN GRIFFIN, Los Angeles, Cal.
CHARLES FREDERICK GROSS, Philadelphia, Pa.
CLARKE KENNERLEY HARVEY, Charleston, W. Va.
CLIFFORD MURRAY HATHAWAY, Effingham, Ill.
PETER MAGNUS LARSEN, Chanute, Kans.
THOMAS LEACH, Buffalo, N. Y.
WALTER POWELL LINTON, St. Paul, Minn.
JOHN CHARLES RATHBUN, Seattle, Wash.
LEON BENEDICT REYNOLDS, Kansas City, Mo.
JAMES GORDON STEESE, Juneau, Alaska
ARTHUR CLARENCE TOZZER, Boston, Mass.
RICHARD GAINES TYLER, Paris, Tex.
GEORGE NEVILLE WHEAT, Rocksprings, Tex.
EARL ALDERFER ZEISLOFT, Akron, Ohio

FROM JUNIOR TO ASSOCIATE MEMBER

HERBERT ASHFORD ROBERTSON AUSTIN, Honolulu, Hawaii
EUGENE WELDON FICKES, Lancaster, Pa.
PERCY JULIAN GREENOUGH, Woodhaven, N. Y.
WILLIAM THOMAS HOGG, New Orleans, La.
GEORGE WILLIAM RICHARDS, Pittsburgh, Pa.
ROBERT FARQUHAR WATT, Detroit, Mich.

The Acting Secretary announced the following deaths:

JAMES GIBBONS BROWNE, of Houston, Tex., elected Associate Member, May 6th, 1914; died April 25th, 1921.

WILLIAM JAMES DAVIS, of Three Rivers, Que., Canada, elected an Associate Member, August 31st, 1915; died September 2d, 1921.

A paper by C. E. Grunsky, M. Am. Soc. C. E., entitled "Rainfall and Run-Off Studies", was presented by the author, and the subject was discussed by Messrs. Thaddeus Merriman, Rudolph Hering, Olin H. Landreth, and the author. Written discussions on the subject by Messrs. C. F. Marvin and Dana M. Wood were read by title only.

A paper by James Munn and J. L. Savage, Members, Am. Soc. C. E., entitled "The Flood of June, 1921, in the Arkansas River, at Pueblo, Colorado", was presented for discussion and illustrated by a large number of lantern slides. Announcement was made by President Webster that written discussions on the subject from Messrs. George G. Anderson and Arthur O. Ridgway,

Members, Am. Soc. C. E., and R. G. Hosea, Deputy State Engineer of Colorado, had been received, and lantern slides accompanying the discussion by Mr. Ridgway were shown.

A paper by C. Terrell Bartlett, M. Am. Soc. C. E., entitled "The San Antonio Flood of September, 1921", was presented by Mr. Bartlett, who illustrated his remarks with lantern slides. The subject was discussed by Messrs. Charles W. Sherman and C. E. Grunsky.

The following report of the Tellers appointed to canvass the ballots on the proposed revision of the Constitution was presented:

"New York, October 5th, 1921.

"The Tellers appointed to count the ballots upon the Amendments to the Constitution submitted to letter-ballot of the Corporate Membership by the Annual Convention of 1921, presents its report, as follows:

"Total number of ballots received..... 1 754

"Excluded ballots:

"From members in arrears of dues.....	48
"Without signature.....	4
"From members other than Corporate Members.....	1
"With identification other than written signature.....	1 54

"Total ballots counted.....	1 700
-----------------------------	-------

"Yes	1 367
"No	326
"Blank	7

"Required to carry.....	1 134
-------------------------	-------

"Carried by.....	233
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"Total vote.....	1 700
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"Percentage, 'Yes'.....	80
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"Respectfully submitted,

"WILLIAM G. GROVE,
"Chairman,

"J. P. H. PERRY,

"C. E. BEAM,

"H. C. HUTCHINS,

"F. LER. STEARNS,

"THADDEUS MERRIMAN,

"Tellers."

The necessary affirmative vote of two-thirds of all ballots cast having been received, the Chairman declared the adoption of the revised Constitution.

Adjourned.

OF THE BOARD OF DIRECTION
(Abstract)

September 12th, 1921.—The Board convened in regular meeting at 10 A. M., at the Headquarters of the Society; President Webster in the chair; Elbert M. Chandler, Acting Secretary; and present, also, Messrs. Beahan, Brown, Clark (came in at 10.20 A. M.); Greene, Herschel, Hogan (came in at 10.20 A. M.), Hovey, Hudson, Humphrey, Hunt (came in at 10.15 A. M.), Pegram (came in at 10.50 A. M.), and Stuart (came in at 10.55 A. M.).

Ballots for membership were canvassed, resulting in the election of 18 Members, 54 Associate Members, and 11 Juniors, and the transfer of 6 Juniors to the grade of Associate Member.

Nineteen Associate Members were transferred to the grade of Member.

A report from the Membership Committee was received and acted on.

Adjourned.

**BIOGRAPHICAL SKETCHES OF CANDIDATES FOR OFFICES
TO BE FILLED AT THE ANNUAL ELECTION,
JANUARY 18th, 1922.**

The Board of Direction, at its meeting of April 26th, 1921, adopted a resolution,* instructing the Acting Secretary to publish short biographical sketches of the candidates for the offices to be filled at the annual election on January 18th, 1922. In accordance with this resolution, these biographical sketches, as prepared by the candidates themselves, are presented herewith.

John Ripley Freeman

(Candidate for President)

Born July 27, 1855, on a farm at West Bridgewater, Me. (Mass. Inst. Tech., B. S., Civ. Eng. Dept., 1876; Hon. Sc. D., Brown Univ., 1904, Tufts Coll., 1905.) —1876-1886 Prin. Asst. Engr., Water Power Co., Lawrence, Mass.: 1878-1886 Prin. Asst. to Hiram F. Mills, Cons. Engr.: 1886-1896 Chf. Engr., Associated Factory Mutual Insurance Companies: 1886 to date Cons. Engr. on water power and mill construction to sundry large manufacturing corporations: 1892-1896 Water Commr., Winchester, Mass.: 1895-1896 Engr. Member, Massachusetts Metropolitan Water Board: 1896 Member, Board of Appraisers, Municipal Water-Works, Newburyport, Mass.: 1896 to date Pres. and Treas., Mfrs., Rhode Island, Mechanics, State, Enterprise, and American Factory Mutual Fire Insurance Companies: 1898 Member, Board of Appraisers, Municipal Water-Works, Gloucester, Mass.: 1899-1900 made extensive studies of water supply for Greater New York, for Finance Dept.: 1902 Civilian Engr. Member, Special Board, Gun Carriage Tests, War Dept.: 1903 Chf. Engr., investigations, Charles River Dam, Boston Harbor: 1903-1904 Cons. Engr., Boston Metropolitan Park Comm., on sanitary and drainage problems: 1903-1905 made extensive studies on safeguarding of life in theatres: 1904 Member, Rhode Island Metropolitan Park Comm.; Member, Special Comm., Additional Water Supply, New York; 1904 Director, Western Power Co., Providence National Bank of Commerce; Cons. Engr., specialties, hydraulics, municipal water supply, water power development, high dams, mill construction, miscellaneous scientific research, fire prevention: 1904-1905 planned water power developments, Feather River, Cal., St. Lawrence River, Long Sault: 1905 to date Cons. Engr., water supplies of Nashua, Los Angeles, Baltimore, Hartford, Newark, City of Mexico, etc.; 1905 to date Cons. Engr. to New York Board of Water Supply: 1906 Member, Board of Appraisers, Municipal Water-Works, Denver, Colo.: 1906-1907 in charge water power investigations, New York State Water Supply Comm.: 1907 and 1909 Cons. Engr. on Isthmian Canal Locks and Dams: 1910 Cons. Engr., San Francisco water supply (planned Hetch Hetchy water supply now building): 1910 Cons. Engr. to Canadian Govt., on water power conservation, safety of various dams, etc.: 1914 planned water power development, Lachine Rapids: 1916 to date studies of flood control in China, and improvement of Yellow River: 1917-1918 Pres. and Acting Chf. Engr., Providence Gas Co.: 1917 to date Cons. Engr. for Chinese Govt., Grand Canal

* *Proceedings, Am. Soc. C. E., May, 1921, p. 460.*

Improvement Board: 1918-1919 Chairman, National Advisory Comm. for Aeronautics; Member, Board of Visitors, U. S. Bureau of Standards.

Carl Ewald Grunsky

(Candidate for Vice-President)

Born April 4, 1855, Stockton, Cal. (Polytechnicum of Stuttgart, Civ. Engr., 1877; Eng. D., 1910)—1878-1888 Asst. State Engr. and Chf. Asst. State Engr., State Eng. Dept. of California, irrigation and flood control: 1888-1890 Cons. Engr. and private practice, Sacramento and San Francisco, irrigation, water supply, sewerage and valuations: 1889-1890 Member of the Examining Comm. on Rivers and Harbors for California: 1892-93 Member of Board to consider San Francisco sewerage problems: 1894-1895 Cons. Engr. to Commr. of Public Works of California: 1899 Engr. in charge of plans for San Francisco sewerage system: 1900-1904 City Engr., San Francisco: 1904-1905 Member of the Isthmian Canal Comm.: 1905-1907 Cons. Engr., U. S. Reclamation Service, and Adviser to the Secy. of the Interior on irrigation matters: 1907 to date Cons. Engr., San Francisco.

Robert Ridgway

(Candidate for Vice-President)

Born October 19, 1862, Brooklyn, N. Y. (New York University, M. S. 1915 (Honorary); C. E., 1919 (Honorary))—1882-1884, Chainman, Rodman, Instrumentman, Northern Pacific Ry.; 1882-1883, reconnaissance surveys; 1883-1884, location and construction: 1884-1900, Instrumentman and Asst. Engr., Aqueduct Commission of New York City; 1884-1886, Instrumentman; 1886-1900 Asst. Engr. in charge of construction of 1½ miles of the new aqueduct and new gate-house at Old Croton Dam, Titicus River Dam and Reservoir, and the Jerome Park Reservoir: 1900-1905, Senior Asst. Engr. of Second Division and Div. Engr. of Fifth Division, Board of Rapid Transit Railroad Commissioners, New York City; 1900-1903 as Senior Asst. Engr., Second Division, on construction of that part of the first four-track subway from 41st Street and Park Avenue, Manhattan, through 42d Street to Broadway and north under that thoroughfare to 104th Street; 1903-1905 as Div. Engr. in charge of the Fifth Division, which included Sections 2, 2-A, and 3 of Contract No. 2, known as the South Ferry Loop (Section 2), the Battery-Joralemon Street Tunnels under the East River (Section 2-A), and the subway under contract in Brooklyn terminating at Atlantic and Flatbush Avenues (Section 3): 1905-1912 Div. Engr. and Dept. Engr., Northern Aqueduct Dept., Board of Water Supply, New York City; 1905-1906 Div. Engr. on studies for an aqueduct with a daily capacity of more than 500 000 000 gal.; 1906-1912 as Dept. Engr. in charge of the location and construction in Northern Aqueduct Dept., which included the northerly 60 miles of the Catskill Aqueduct, and the deep pressure tunnel under the Hudson River at Storm King, cost of work approximately \$30 000 000: 1912-May, 1921 Engr. of Subway Constr., Public Service Commission for the First District, State of New York (succeeded by the Office of Transit Construction Commissioner).

and the present Transit Commission), in charge of construction of the system of rapid transit subways and elevated lines in New York City, including five tunnels under the East and Harlem Rivers, cost when completed to be more than \$300 000 000; May, 1921 appointed Chf. Engr. of the Transit Commission: 1916 Member of Chicago Traction and Subway Commission to report on and make recommendations for improvement of Chicago transit conditions.

Otis Ellis Hovey

(Candidate for Treasurer)

Born April 9, 1864, East Hardwick, Vt. (Dartmouth Coll., B. S., 1885: Thayer School of Civ. Eng., C. E., 1889)—1885-1886 Engr. of Hoosac Tunnel and Wilmington R. R.: 1886-1887 Draftsman, Edge Moor Iron Co.: 1888 on the staff of D. H. and A. B. Tower, charge of dam and paper-mill improvements: 1889-1890 Instructor in Civ. Eng. at Washington Univ., St. Louis, Mo.: 1890-1896 associated with the late George S. Morison, in charge of Chicago office on designs and estimates of bridges, including the Bellefontaine, Alton, and Leavenworth Bridges; also railroad yard and structures for the St. Louis entrance of the Chicago, Burlington & Quincy R. R.; designed and was Res. Engr. on a four-track bascule bridge in Chicago: 1896-1900 Engr. of Union Bridge Co., in charge of bridge and structural work: 1900-1907 Engr. of Design, American Bridge Co.: 1907 to date Asst. Chf. Engr., American Bridge Co.

Clifford Milburn Holland

(Candidate for Director, District No. 1.)

Born March 13, 1883, Somerset, Mass. (Harvard Univ., A. B., 1905; S. B., 1906)—1906-1919 Asst. Engr., Tunnel Engr., and Div. Engr., Public Service Comm., First District, State of New York, on subway and tunnel constr.; 1914-1919 as Tunnel Engr. and Div. Engr. in charge of construction of eight tubes with approaches under the East River, contract value, \$26 000 000: 1919 to date, Chf. Engr., Hudson River Vehicular Tunnel, estimated value \$28 700 000.

Joseph Johnson Yates

(Candidate for Director, District No. 1.)

Born April 20th, 1874, Elizabeth, N. J. (Rutgers Coll., 1894)—1895-1896 Pennsylvania R. R. on maintenance of way: 1897-1899 Central R. R. Co. of New Jersey on construction: 1899-1902 general business: 1902-1907 Asst. Engr., Central R. R. Co. of N. J., design and construction of bridges, buildings, piers, and general railroad construction: 1907 to date, Bridge Engr., Central R. R. Co. of N. J., in charge of bridge and structural steel design and construction, including two double-track drawbridges with approach spans over the Hackensack and Passaic Rivers, five bascule bridges with approaches on the Seashore Branch, seven export piers in New York Harbor, the Delaware River Bridge at Easton, Pa., the Lehigh River bridges at Bethlehem, Allentown, Mauch Chunk, and Glen Onoko, Pa., the passenger and express terminals at Communipaw, Jersey City and Newark, N. J., and the car shops at Elizabethport, N. J., and Ashley, Pa.

Frank Edward Winsor

(Candidate for Director, District No. 2.)

Born November 16, 1870, Johnston (now Providence), R. I. (Brown Univ., Ph. B., 1891; C. E., 1892; A. M., 1896)—Prior to 1891 one year on railroad engineering: 1891-1894 Metropolitan Sewerage System, Boston, Mass.: 1895-1902 Metropolitan Water-Works of Massachusetts: 1903 preliminary investigations for a new water supply for New York City: 1904-1905 Prin. Asst. Engr., Charles River Dam and Basin, Boston, Mass.: 1906-1909 Div. Engr., Catskill Water Supply System for New York City: 1910-1915 Dept. Engr., Southern Aqueduct Dept. of the Catskill Water Supply: 1915 to date Chf. Engr., Water Supply Board, City of Providence, R. I., in charge of design and construction of a new water supply system for the city.

John Needels Chester

(Candidate for Director, District No. 6.)

Born September 24, 1864, near Columbus, Ohio (Univ. of Illinois, B. S., 1891; C. E. (Honorary); M. E. (Honorary))—1891 Engr. and Salesman, Boughen Eng. Co., Cincinnati: 1892 Field Supt., National Water Supply Co. of Cincinnati, engaged on work at Sioux City, Iowa, and Fort Crook, Nebr.; 1893-1894 Prin. Asst. Engr., American Debenture Co., Chicago and New York, which company owned and operated thirteen water-works plants in the United States: 1895-1899 Engr. and Salesman, Henry R. Worthington of New York, Mfrs. of Pumping Machinery: 1899-1906 Chf. Engr., American Water-Works & Guarantee Co. of Pittsburgh, which company then owned and operated forty-two water-works: 1906-1911 Gen. Mgr. and Engr. for the Epping-Carpenter Co., Pittsburgh, Mfrs. of Pumping Machinery: 1911 to date firm of Chester & Fleming and its successor, The J. N. Chester Engrs., water-works, sewerage, concrete structures, and power plants; Pres. of the Edgeworth Water Co., supplying Edgeworth, Leetsdale and Fair Oaks, Pa.; Vice-Pres. and Gen. Mgr. of the Capital City Water Co., supplying Jefferson City, Mo.; Pres. of the Upper Sandusky, Ohio, Water-Works Co.

Arthur James Dyer

(Candidate for Director, District No. 8.)

Born May 27, 1868, Medfield, Mass. (Vanderbilt University, 1891)—1902, Draftsman for Phoenix Bridge Co. and Milliken Bros.; Engr. for Youngstown Bridge Co. and American Bridge Co.: 1902 organized the company which in 1904 became the Nashville Bridge Co.: 1904 to date Chf. Engr. and Mgr., Nashville Bridge Co., construction of bridges, buildings, ships, barges and tugboats.

Walter Leroy Huber

(Candidate for Director, District No. 13.)

Born January 4, 1883, San Francisco, Cal. (Univ. of California, B. S., 1905)—1904-1905 Eng. Staff, Oakland Realty Syndicate, on layout and construction of streets now included in City of Piedmont, Cal.: 1905-1906 struc-

tural and hydro-electric design: 1906-1910, Chf. Structural Designer for one of the principal firms rebuilding San Francisco after the earthquake and fire; Chf. Engr. for the Superv. Archt., Univ. of California, on bridges, buildings, etc.: 1910-1913 Dist. Engr., Dist. 5, U. S. Forest Service, all engineering work for Forest Service in California and Southwestern Nevada: 1913 to date Cons. Engr., San Francisco, hydro-electric power development, irrigation development, investigations and reports for Irrigation Dist. Bond Comm., structural design and construction.

ITEMS OF INTEREST

This Society is not responsible for any statement made or opinion expressed in its publications.

The Committee on Publications will be glad to receive communications of general interest to the Society, and will consider them for publication in *Proceedings* in "Items of Interest". This is intended to cover letters or suggestions from our membership concerning matters which are not of a technical character. Such communications, however, must not be controversial or commercial.

THE ENGINEERING FOUNDATION

The Engineering Foundation was established in 1914 "for the furtherance of research in science and engineering, or for the advancement in any other manner of the Profession of Engineering and the good of mankind", and for the following purposes: To promote and support worthy researches related to engineering in all its branches; to establish and operate engineering research laboratories, if funds be provided therefor; to co-operate with National Research Council and the Engineering Societies in the stimulation and co-ordination of scientific research.

ENDOWMENT FUNDS NEEDED.

The Foundation needs a large increase of endowment. It is obliged frequently to refuse to support research projects brought to it because it lacks funds. Gifts of \$1 000 or more are desired. Each donor of \$250 000 or more will be honored as a Founder. A gift of \$50 000 has been offered contingent on the receipt of nine other gifts of \$50 000 each. Gifts to the Foundation are exempt from income tax. A gift for research is a productive investment.

The Foundation is compiling a directory of the hydraulic laboratories of the United States, and is planning an investigation of industrial education and training. It undertakes useful researches which do not promise profits sufficient to tempt industrial organizations to undertake them, researches which should be made under disinterested auspices, and researches which lie outside the province of Government bureaus.

The Engineering Foundation is administered under the auspices of the United Engineering Society, the American Society of Civil Engineers, the American Institute of Mining and Metallurgical Engineers, the American Society of Mechanical Engineers, and the American Institute of Electrical Engineers, by a board of thirteen representatives of these Societies, and three members at large.

A progress report of the Foundation, a form of Deed of Gift, and other information will be sent by the Secretary, Alfred D. Flinn, M. Am. Soc. C. E., 29 West 39th Street, New York City, on request.

Progress Report to Engineering Foundation Board

The regular meeting of the Engineering Foundation Board was held on September 8th, 1921, and the following is a brief review of the projects of Engineering Foundation as presented by its Secretary to the Board:

FATIGUE OF METALS.

Within the limited field financed by Engineering Foundation, definite results have been obtained. The complete report on this subject, to be printed later as a *Bulletin* of the University of Illinois, is as nearly ready for publication as it can be before finishing some experiments and final editing. Work on the programme of the General Electric Company continues satisfactorily. The Air Service of the Army is negotiating for an extension of the research, and it is possible that certain industries will support additional experiments.

ADVISORY BOARD ON HIGHWAY RESEARCH.

After several months of disappointing endeavors to secure funds, an agreement was made between the U. S. Bureau of Public Roads and the National Research Council, by which the Bureau undertakes to pay \$12 000 yearly in return for services to be rendered by the Advisory Board. Several State highway departments have definitely promised contributions, and others are expected to contribute. With this report, in addition to \$1 000 from Engineering Foundation and \$500 from the National Research Council, W. K. Hatt, M. Am. Soc. C. E., of Purdue University, was engaged as Director and began his duties in July, 1921.

DESCRIPTIVE DIRECTORY OF HYDRAULIC LABORATORIES.

The greater part of the information for this Directory has been collected. Its compilation is well started, and the Directory should be ready for press shortly.

COMMITTEE ON INDUSTRIAL EDUCATION AND TRAINING.

The expected large financial support for this work has not been forthcoming. Bibliographies of the literature made by Director Craver, of the Engineering Societies Library, and the Secretary of Engineering Foundation, have been in demand, and the subject continues to receive active attention, especially from mechanical engineers.

RESEARCH NARRATIVES.

These pamphlets have elicited many commendations. The mailing list has grown from 900 to 1 300, principally by direct individual requests. A number of the "Narratives" have been reprinted by the daily papers in various parts of the country and by technical journals.

MISCELLANY.

Many calls for help in a wide variety of subjects come to Engineering Foundation from both domestic and foreign sources—individuals, companies,

societies, and governments. Among the foreign "clients" may be mentioned, the Republic of Czechoslovakia, through its Minister at Washington, the University of Louvain, Belgium, through the head of its Department of Engineering, and the University of Lemberg (Lwow), Poland.

Although Engineering Foundation is not able to undertake projects requiring large expenditures, it is doing useful work, and its name is becoming widely and favorably known.

ACTIVITIES OF LOCAL SECTIONS***Meeting of the Buffalo Section**

A meeting of the Buffalo Section was called to order at the Old Colony Club, at 12.30 p. m., on October 4th, 1921; President A. L. Johnson in the chair; and Bruce L. Cushing, Secretary.

President Johnson explained that the recent request for experience records from all members of the Section was made in order to enable him to make better selections of members for special work, such as committee appointments, papers on certain subjects, etc., and urged that those not having made a return do so in the near future.

A short discussion of the subject of Registration or Licensing of Engineers showed a wide diversity of opinion among the members of the Section in regard to this matter, but no action was taken by the meeting.

On motion, duly seconded, the Secretary was ordered to write to the Engineering Society of Buffalo expressing the hope that the Society may be successful in devising a method of co-operation with the many technical societies now in Buffalo, and assuring it that the Section is willing to give due consideration to any plan proposed for more united action.

On motion, duly seconded, the President was authorized to appoint four committees as follows: a committee of three members to consider and report on all subjects of the Parent Society; a committee of five to study and assist in the work of the American Engineering Standards Committee; a committee of three to keep informed of the action of the Federated American Engineering Societies; and an Entertainment Committee of three to procure speakers or otherwise provide entertainment for the Section. All these committees were appointed to serve for one year.

Messrs. W. P. Feeley and D. P. Cooper were elected as members of the Section.

**BUFFALO SECTION PARTICIPATES IN INSPECTION TRIP OF
NEW HYDRO-ELECTRIC DEVELOPMENT**

An invitation was extended to the Buffalo Section to join an inspection trip to Chippewa, Ont., Canada, on October 8th, 1921, to view the new hydro-electric development at that place.

Other societies participating in this excursion were the Engineering Society of Buffalo, the Rochester Engineering Society, and the Niagara Peninsula Branch of the Engineering Institute of Canada.

Regular Meeting of the Cleveland Section

A regular meeting of the Cleveland Section was held at the Winton Hotel on September 14th, 1921; President J. E. A. Moore, in the chair; George H. Tinker, Secretary; and present, also, 27 members.

The minutes of the meeting of May 11th, 1921, were read and approved.

A communication from the Acting Secretary of the Society in reference to Student Chapters was read.

* For list of Local Sections, Officers, etc., see p. 810.

The Secretary reported the deaths of William Henry Searles, M. Am. Soc. C. E., and John Edward Grady, Assoc. M. Am. Soc. C. E.

Communications from the St. Louis Section relative to the status of engineers in the U. S. Public Health Service, and from the Texas Section in reference to a bill in the House of Representatives providing funds for completing the mapping of the United States, were read, and, on motion, duly seconded, were referred to the Legislative Committee with instructions to ascertain and report on the present status of these Acts.

Attention was called to the Questionnaire sent out by the Special Committee of the Society on Bearing Value of Soils, and members were urged to submit information on the subject in their possession.

The Secretary read resolutions from the St. Louis and Los Angeles Sections relative to the proposed new Constitution of the Society. The subject was generally discussed, and, on motion, duly seconded, it was unanimously voted that it was the opinion of the members present that the proposed Constitution should be defeated, and the Secretary was instructed so to advise members of the Section.

It was moved and seconded that an evening meeting of the Section be held to consider the Union Depot controversy. After discussion by various members, during which the opinion was expressed that the questions at issue were not engineering questions, the motion was lost.

Regular Meeting of Duluth Section

A regular meeting of the Duluth Section was called to order at 12.15 P. M., on September 19th, 1921; President John L. Pickles, in the chair; W. G. Zimmermann, Secretary; and present, also, 21 members and 3 guests.

After the guests had been introduced by President Pickles, and the minutes of the August 15th, 1921, meeting read and approved, the Secretary presented a letter from the Texas Section in reference to the Topographical Mapping Bill now before the Committee on Interstate and Foreign Commerce of the House of Representatives. The subject was discussed by Messrs. Coe, Clark, Marks, and Hoyt, and on motion, duly seconded, the letter was ordered to be filed.

Mr. W. E. Hawley called the attention of the members to the bill for Licensing of Architects, Engineers, and Land Surveyors which was passed by the last State Legislature of Minnesota, pointing out certain objections to the form of invitations recently sent out by the Board of Registration pertaining to the matter of application for registration. The points brought up by Mr. Hawley were discussed by Messrs. Herrold, Woodbridge, and others, but no definite conclusion in regard to the subject was reached, and the matter was postponed until the next meeting.

A brief address was made by Mr. G. H. Herrold, Managing Director of the City Planning Board of St. Paul, Minn., on the subject of "City Planning". In the course of his talk, Mr. Herrold pointed out "that city planning is not an architectural but an engineering problem, and that in his judgment it is necessary that engineers take hold of it and work out the details on the basis of scientific data". He also pointed out "that city planning should be carried

on by a committee of citizens without having political influence affect the work". Mr. Herrold was scheduled to appear before the Engineers' Club of Duluth to give a more detailed discussion of the subject of City Planning, and President Pickles urged all the members present to attend the meeting of the Engineers' Club in the evening.

Messrs. O. H. Dickerson and W. E. Hawley led the discussion of the proposed new Constitution of the Society.

Mr. D. A. Reed, Manager of the Duluth Water and Light Department, gave an informal talk on the subject of the Duluth City Water Supply during which he urged that the proposed City Planning Commission take up the questions of water supply, sewage disposal, etc. He also mentioned the sanitary survey of the west end of Lake Superior as an aid in determining the best location for a new pumping station, and discussed the work of covering the city reservoirs.

Regular Meeting of Los Angeles Section

The regular meeting of the Los Angeles Section was called to order at the Union League Club on August 10th, 1921; President H. W. Dennis, in the chair; A. F. Barnard, Secretary *pro tem.*; and present, also 25 members and 11 guests.

Following the customary dinner and recess, President Dennis introduced seven new members of the Section and the guests of the evening.

President Dennis referred to the status of the matter of licensing of engineers in District No. 11, and read a letter which he had written to Mr. Richard L. Humphrey, of New York City, Chairman of the Committee on Licensing Engineers. Mr. W. K. Barnard reported the action taken in relation to licensing of engineers by the Joint Committee of the Technical Societies of Los Angeles.

A letter from the Secretary of the Joint Committee of the Technical Societies of Los Angeles was read requesting action by the Section on Draft No. 6 of the Constitution of the California Federated Technical Societies. On motion, duly seconded, this matter was referred to the Board of Directors for action.

President Dennis declared the meeting open for discussion of the report of the Committee on Conservation which was appointed to review and prepare a résumé of the "Marshall Plan". Various phases of this subject were discussed by Messrs. Morris, Howell, Barnard, Tait, Reed, Hill, Harris, and Anderson, and on motion, duly seconded, the report of the Committee with its recommendations was adopted.

Mr. A. L. Harris moved that nomination of the Committee of Five recommended in the report of the Committee on Conservation he made at this time. This motion was seconded by Mr. W. K. Barnard, and after discussion and amendment a motion was carried that the Chair appoint the Committee. Further discussion was had on various matters connected with the co-operation of the members of the Section, as suggested by recommendations in the report of the Committee on Conservation, and after it had been explained that the Committee of Five would advise the membership in regard to co-operation,

it was agreed, on motion, duly seconded, that no action should be taken at this meeting.

President Dennis then invited discussion on the proposed revision of the Constitution of the Society. It was moved by Mr. W. K. Barnard that the meeting proceed to discuss the subject, which motion was seconded and carried. A full discussion of the proposed revision of the Constitution followed, and, on motion, duly seconded, the following resolution relative to the subject was unanimously adopted:

"Whereas: The Revised Constitution of the American Society of Civil Engineers, as submitted to the Board of Direction by the Committee on Referred Amendments, and now to the members for ballot to be canvassed on October 5th, while incorporating provisions for equality in representation, for fixing the status of the Secretary, and for the transfer to the By-Laws of certain Sections of the Constitution, all of which meet with approval, fails to give effect to recommendations of the Committee on Development which have heretofore been approved by substantial majorities of the votes recorded, as that all members be assigned to Local Sections, that the officers of the Society, other than Directors, be nominated by representatives of the Local Sections in annual conferences and does not improve the qualifications for membership nor provide more effective means for discipline or expulsion as suggested by the Committee on Development; and

"Whereas: A complicated method for the nomination and election of officers is provided which affords opportunity to defeat the principle that 'the Director for each District shall be elected by vote of the corporate members therein' previously approved by large majority of the votes of the members; and,

"Whereas: Incorporation of these several features is essential to a Revised Constitution at this time, and their omission implies immediate amendment of the new document in the event of its adoption;

"Be it Resolved: That the Los Angeles Section, American Society of Civil Engineers, after consideration and study of the proposed Revised Constitution is of opinion that it should not be adopted; and

"Be it Further Resolved: That copies of this Resolution be forwarded by the Secretary, to the Board of Direction, and to all of the Local Sections of the American Society of Civil Engineers."

Dr. Julius Koebig, Chairman of the Engineers' Advisory Committee of the Los Angeles Chamber of Commerce, was introduced, and presented a copy of an excerpt from the minutes of the meeting of that Committee on June 10th, 1921, relative to a resolution presented by that Committee concerning the organization of a Sewer Commission by the City Council. On motion, duly seconded, the matter was referred to a Committee of Three to be appointed by the Chair. President Dennis subsequently appointed Messrs. Sellew, Adams, and Dessery as such Committee.

MEETING OF SEPTEMBER 14TH, 1921.

A regular meeting of the Los Angeles Section was called to order at the Union League Club on September 14th, 1921; President H. W. Dennis, in the chair; F. G. Dessery, Secretary; and present, also, 48 members and 16 guests.

President Dennis introduced H. T. Corey, M. Am. Soc. C. E., as the speaker of the evening, who addressed the Section on "The Larger Nile Project". In the course of his remarks on the irrigation problems of Egypt and the Soudan, Mr. Corey, who served on the International Commission which investigated the

subject in 1920, pointed out the problems of control and pondage of waters from the Blue Nile and the White Nile, and the various causes leading to the contention between Egypt and the Soudan over water rights in the Nile Valley. Mr. Corey also discussed the work of the International Commission and described many interesting customs of the people in these countries, their agricultural methods, the climatic conditions, and the British administration of affairs in Egypt and the Soudan. The subject was discussed by Messrs. Hill, Dennis, Tait, and Smith.

President Dennis referred briefly to resolutions of the St. Louis Section and other correspondence relative to the proposed revision of the Constitution of the Society.

F. L. Sellew, Chairman of the Sewage Committee, reported progress of the Committee's work.

President Dennis announced the continuation of the Committee on Conservation with Mr. Franklin Thomas, as Chairman, and Messrs. T. D. Allin, S. B. Morris, E. A. Rowe, and W. S. Post, as the other members.

A brief address on the proposed location of the new Public Library was made by Mr. W. D. Smith, Secretary of the City Planning Association, and President Dennis ordered this matter referred to the Committee on City Planning.

New York Section Announces Programme for the Season of 1921-1922

The New York Section has announced its programme for the season of 1921-22, in the arrangement of which the main thought has been to adhere to the principle laid down by the Section in its first year of activity, namely, to confine itself largely to the discussion of problems touching the engineering life of the Metropolitan District. With that end in view, six of the eight meetings concern themselves with such problems.

Three joint meetings with the New York Sections of other National Engineering Societies have been arranged in continuance of last years' practice in that respect. One of these meetings relates to a Metropolitan District Problem, that of the Port of New York, and the other two with matters of more general engineering interest. The Section this year proposes to have a more limited number of invited speakers, ranging from five to seven, and to allow a fair amount of time for discussion from the floor. The programme has been prepared by a committee of which E. J. Mehren, Assoc. Am. Soc. C. E., is Chairman, and although the meetings are planned under the auspices of the New York Section, all members of the Society are cordially invited to attend. The programme as it has been outlined for the season is as follows:

October 19th, 1921.—"Financing Public Utilities and Large Engineering Projects." This meeting will be a joint meeting with the New York Sections of the American Society of Mechanical Engineers, the American Institute of Mining and Metallurgical Engineers, and the American Institute of Electrical Engineers, and the opening address will be made by Mr. A. B. Leach, of A. B. Leach and Company, Bankers.

November 14th, 1921.—"The St. Lawrence Ship Channel and Power Project." This will also be a joint meeting with the New York Sections of the

American Society of Mechanical Engineers, the American Institute of Mining and Metallurgical Engineers, and the American Institute of Electrical Engineers, and the subject will be presented by the Hon. Henry J. Allen, Governor of Kansas, and will probably be discussed by the Hon. Nathan L. Miller, Governor of New York State.

December 21st, 1921.—"The Zoning Law—What It Has Done for New York." The opening address on this subject will be made by Edward M. Bassett, Counsel of the Zoning Committee, and Chairman of the Commission which framed the Zoning Law.

January 11th, 1922.—"Traffic Handling—Its Engineering as Well as Regulatory Aspects." The subject will be introduced by E. P. Goodrich, M. Am. Soc. C. E., Consulting Engineer, and Amos Schaeffer, M. Am. Soc. C. E., Consulting Engineer to the President of the Borough of Manhattan.

February 15th, 1922.—"Removal of Solid Wastes." John P. Leo, Commissioner of Street Cleaning, New York City, will make the opening address.

March 15th, 1922.—"Port of New York." This will be a joint meeting with the New York Sections of the American Society of Mechanical Engineers, the American Institute of Mining and Metallurgical Engineers, and the American Institute of Electrical Engineers, and the opening address will be made by E. H. Outerbridge, Chairman of the Port of New York Authority.

April 19th, 1922.—It is hoped that on this date a discussion may be had on the "Proposed Hudson River Bridge," but due to certain contingencies in connection with the work of the corporation promoting the project, the meeting cannot be assured until early in the new year, and, therefore, announcement thereof will be made later.

May 17th, 1922.—"Need of Regional Planning for the New York District." The opening address on this subject will be made by Charles D. Norton, First Chairman of the Plan of Chicago, Ill.

The meetings will be called to order promptly at 7.45 p. m., and unless announcement is made to the contrary later, they will all be held at the Engineering Societies Building, 33 West 39th Street, New York City.

Meeting of the Portland, Ore., Section

A meeting of the Portland Section was held at Peninsula Park Community House on September 16th, 1921. A basket supper was served at 6.30 p. m., and was followed by a short business session with President Reed in the chair; C. P. Keyser, Secretary; and present, also, 20 members and 3 guests.

The minutes of the meeting of April 15th, 1921, were read and approved. The minutes of the Board meetings of June 16th and July 18th, 1921, were also read, and President Reed explained the business of these two meetings, giving an outline of the Questionnaire on Fair Sites which was prepared by the Committee and, on motion, duly seconded, a copy of the Questionnaire was placed on file.

Mr. F. F. Henshaw reviewed the progress of the Committee on National Parks Aggression. It was stated that Mr. Henshaw having retired from the Committee, a final report would be made by Messrs. B. S. Morrow and D. W. Cole. On motion, duly seconded, the Committee was continued.

A letter dated September 2d, 1921, from Mr. J. C. Ralston was read in relation to the appointment of a committee to promote the technical interests and activities of the Society, and on motion, duly seconded, the matter was referred to the Board of Directors with power to act.

The matter of voting on the proposed revised amendments to the Constitution of the Society, which vote is to be canvassed October 5th, 1921, was presented for brief comment. Mr. J. C. Stevens urged all members of the Section to vote, and, on motion, the Secretary was instructed to secure 25 additional ballots from the New York office.

A communication from Mr. Richard L. Humphrey, Chairman of the committee appointed by the Board of Direction to report on the whole question of licensing professional engineers, was read. President Reed called on Mr. O. Laurgaard, President of the Board of Engineering Examiners for Oregon, for discussion of the Oregon statute, in which he was asked for both beneficial and detrimental results. Mr. Laurgaard reviewed the history of registration in the State of Oregon, stating that the statute with minor modifications was the model law proposed some years ago by a committee of the Parent Society. In the beginning of its operation, many ineligible applicants were registered, but as the workings of the law advanced, its administration is automatically eliminating and excluding those who are not entitled to register as professional engineers. Mr. Laurgaard also expressed the opinion that the full benefits of the law, either to the public or to the profession, would not be realized for at least 10 years, until the country at large adopted more or less uniform pertaining laws.

On motion, duly seconded, the Secretary was instructed to send out letters to the membership of the Section for expressions of individual opinions on the subject.

St. Louis Section and New Public Work Construction

The 105th regular meeting of the St. Louis Section was held at the American Hotel, on September 26th, 1921; Past-President Edward E. Wall in the chair; W. R. Crecelius Secretary; and present also 23 members.

A nominating committee consisting of three members was appointed to nominate officers of the Section for 1922.

The meeting was devoted to a discussion of the advisability of proceeding with the construction of new public work at the present time instead of awaiting lower material prices and also lower wages. The subject was generally discussed by those present, but a decided difference of opinion developed, and no definite conclusion was reached.

EMPLOYMENT SERVICE OF THE FEDERATED AMERICAN ENGINEERING SOCIETIES

An Engineering Societies Service Bureau was established December 1st, 1918, as an activity of Engineering Council, managed by a board made up of the Secretaries of the four Founder Societies, funds for its maintenance being provided by these Societies. On January 1st, 1921, this Bureau was taken over by The Federated American Engineering Societies and is now known as the Employment Service of that organization. It is co-operating with engineering organizations in all parts of the country and is desirous of increasing such co-operation by working with local engineering associations and clubs. Members of the American Society of Civil Engineers who desire to register should apply for further information, registration forms, etc., to Walter V. Brown, Manager, Engineering Societies Building, 29 West 39th Street, New York City. In order to be included in the list published in *Proceedings*, copy must be received on or before the first Wednesday of each month. All communications should be addressed to Mr. Brown.

EMPLOYMENT BULLETIN

POSITIONS AVAILABLE

CONSULTING ENGINEERS experienced in building design are wanted as Sales Representatives in the following cities: Dayton, Columbus, Cincinnati, San Francisco, Los Angeles, Spokane, Seattle, Tacoma, Toledo, Buffalo, Rochester, Atlanta, Denver, Salt Lake City; Montreal, and Toronto. The work does not require a large amount of time, but men of the very best caliber are absolutely essential. The Sales Representative must be a man who is in close touch with the building situation in his territory. Sales experience is not as important as ability to think straight. Each territory offers a splendid opportunity for the right man. X-1015.

ENGINEERS (2), with some experience in irrigation. It is necessary that the appli-

cants be able to speak Spanish to some extent. Location, Santo Domingo. X-1068.

SALESMEN with practical engineering experience and who have sold technical products. Must have had road experience. Two men needed. One for New England and one for local territory. Also, two for Western territory. X-1107.

IRRIGATION ENGINEER qualified in office and field routine and in the operation and maintenance of a large irrigation project. Must be well versed in organization, water distribution, and determination of flow. Permanent position which will afford excellent prospects for advancement. Application by letter. State education, experience in detail, and least salary to start. Location, California. X-1123.

MEN AVAILABLE

GRADUATE CIVIL ENGINEER, Assoc. M. Am. Soc. C. E., age 35; married. Ten years' experience in structural design, detailing, estimating, and supervision of reinforced concrete, steel, and timber buildings. For past four years have been engaged with contractor in industrial plant layout and design. Desires connection in Philadelphia district. CE-260.

ENGINEER WITH FOREIGN CONNECTIONS, Assoc. M. Am. Soc. C. E. Has designed and shipped material and equipment for industrial and housing purposes in the Latin Americas and the Far East. Thoroughly experienced in export work of this type and in constant touch with the construction material market throughout the world. Has office space and organization available. Open to any inducement. CE-261.

CONSTRUCTION MANAGER, age 40. Fifteen years' experience as Engineer and Superintendent, including construction of railroads, bridges, highways, difficult foundations, coffer-dams, caissons, docks, piers, shipways, bulkheads, wood, concrete, and steel piling dredging, etc. A capable organizer and executive. CE-262.

CIVIL ENGINEER, Assoc. M. Am. Soc. C. E., age 36. Eighteen years' experience on construction work. Extensive experience on river and harbor improvements; surveys for and supervision of hydraulic dredging; supervision of pile foundations and heavy concrete construction. Has had charge of office and field construction and surveys. More than 10 years in responsible charge of work. Location preferably in New York City, Newark, N. J., or immediate vicinity. CE-263.

CONSTRUCTION ENGINEER OR SUPER-INTENDENT, Assoc. M. Am. Soc. C. E., age 39, married. Eighteen years' broad experience in construction field, including industrial plants, buildings, steam power stations, heavy concrete construction, foundations, sewers, highways, docks, and railroads. Familiar with costs, estimates, progress, etc. Can handle both field and office work. Available at once. Location immaterial. CE-264.

STRUCTURAL ENGINEER, 1913 technical graduate, Assoc. M. Am. Soc. C. E. Experience as follows: Design and maintenance of structures and equipment of industrial plants; design of large bridges and buildings of various types and materials; building estimating; building construction and installation of electrical equipment and pipe lines. Has been in charge of designs, estimating, and construction work. Available about October 15th. CE-265.

CIVIL ENGINEER, college graduate, M. Am. Soc. C. E. Twenty years' broad practical engineering and contracting experience on water-works, sewers, highways, hydraulics, and general engineering; with engineers, contractors, and utility holding companies; investigations, reports, design, construction, appraisals. Excellent record and references. Will

consider any proposition, engineering or associated work. Member of American and New England Water Works Associations, etc. CE-266.

COST ENGINEER, age 30. Seven years' experience on railroad work, two years as Cost Engineer for a large oil refining company. Desires position with industrial corporation to install and operate Cost, Statistical and Insurance Departments. Prefer South or West, but will accept in other locations. CE-267.

ENGINEER, M. Am. Soc. C. E., technical graduate, age 35. Twelve years' executive experience, designing and constructing all types of structures, subways, viaducts and large factories; steel and reinforced concrete buildings, water supply, sewer system, boiler house, piers, railways and roads. Desires executive position with contractor, manufacturer or engineering firm. CE-268.

ENGINEER, DESIGNER, AND EXECUTIVE, M. Am. Soc. C. E., age 41, married. About twenty years' experience as engineer and executive. Specialist in the design of water purification plants, having spent more than fifteen years in this line. Would like to associate with engineer or contractor in a general line, but specializing in mechanical filtration. CE-269.

ANNOUNCEMENTS

The Reading Room of the Society is open from 9 A. M. to 6 P. M., and from 7 P. M. to 10 P. M., every day, except Sundays, New Year's Day, Washington's Birthday, Memorial Day, Fourth of July, Labor Day, Thanksgiving Day, and Christmas Day; during July and August, it is closed at 6 P. M.

FUTURE MEETINGS

November 16th, 1921.—2 P. M.—There will be a Symposium on "Stream Pollution and Sewage Disposal".

November 16th, 1921.—8.00 P. M.—A regular business meeting will be held, and a paper by Louis L. Tribus, M. Am. Soc. C. E., entitled "Odors and Their Travel Habits", will be presented for discussion.

This paper was printed in *Proceedings* for August, 1921.

November 17th, 1921.—8 P. M.—There will be a Symposium on "Water Supply and Water Purification".

These meetings will be held in connection with the Annual Meeting of the American Public Health Association.

LIST OF NOMINEES FOR THE OFFICES TO BE FILLED AT THE ANNUAL ELECTION, JANUARY 18th, 1922.*

The following list of nominees for the offices to be filled at the Annual Meeting, January 18th, 1922, received from the Nominating Committee, was presented to the Board of Direction at its meeting of October 10th, 1921. The list has already been mailed to all Corporate Members:

For President, to serve one year:

JOHN R. FREEMAN, Providence, R. I.

For Vice-Presidents, to serve two years:

C. E. GRUNSKY, San Francisco, Cal.
ROBERT RIDGWAY, New York City.

For Treasurer, to serve one year:

OTIS E. HOVEY, New York City.

For Directors, to serve four years:

CLIFFORD M. HOLLAND, New York City.....	District No. 1
JOSEPH J. YATES, Jersey City, N. J.....	District No. 1
FRANK E. WINSOR, Providence, R. I.....	District No. 2
JOHN N. CHESTER, Pittsburgh, Pa.....	District No. 6
ARTHUR J. DYER, Nashville, Tenn.....	District No. 8
WALTER L. HUBER, San Francisco, Cal.....	District No. 13

SECOND MEETINGS OF THE MONTH

Under authority given by the Board of Direction at its meeting of August 9th, 1920, the Acting Secretary has made an arrangement with the New York

* For biographical sketches of the candidates for offices see p. 791.

Section whereby the latter will take over the second meeting of the month, and will thus hold its own meetings on the third Wednesday of each month, except January and May, when they are held on the second Wednesday.

The programmes of the New York Section* are similar to those heretofore offered by the Society's Committee on Second Meeting of the Month, and it is understood that all members of the Society are invited to attend the meetings regardless of whether or not they may be members of the Section. This arrangement gives each member the same privilege of attendance at meetings which he has heretofore enjoyed, and is deemed especially desirable since there has been considerable doubt as to the attendance that might develop at the several meetings if three were held in each month.

"TRANSACTIONS" FOR SALE

It is possible to secure a fairly complete set of the *Transactions* of the Society for a very reasonable price as, owing to limited storage space, the Board of Direction has decided to dispose as rapidly as possible of surplus stock

Some volumes are entirely out of print. Of those available, the following can now be furnished to *members of the Society* for the prices noted:

Vols. 2, 6, 9-10, 15-20, 22, 24-27, 29-42, 44.....	(30 Vols.)	\$50
" 45, 49-53, Parts A-F of 54, 55-67, 69-70, 72-79.....	(35 ")	\$50

It is suggested that members wishing these volumes send in their orders promptly, as the supply of certain of them is limited. Requests will be filled in order of receipt.

A deduction of \$2 per volume will be made for any volume out of print when the order is received.

SEARCHES IN THE LIBRARY

As the Library of the American Society of Civil Engineers has been merged in the Engineering Societies Library, requests for searches, copies, translations, etc., should be addressed to the Director, Engineering Societies Library, 29 West 39th Street, New York City, who will gladly give information concerning the charges for the various kinds of service. A more comprehensive statement in regard to this matter will be found on page 21 of the Year Book for 1921.

PAPERS AND DISCUSSIONS

Members and others who take part in the oral discussions of the papers presented are urged to revise their remarks promptly. Written communications from those who cannot attend the meetings should be sent in at the earliest possible date after the issue of a paper. Written discussion on a given paper will be closed three months after the paper has been published, so that the author's closure can be printed four months after the paper.

All manuscripts submitted for publication should preferably be typewritten, and always double spaced. Drawings and diagrams should be on separate sheets, drawn to a scale suitable for about one-half to one-fourth reduction.

All papers accepted by the Publication Committee are classified by the Committee with respect to their availability for discussion at meetings.

* See p. 803.

Papers which, from their general nature, appear to be of a character suitable for oral discussion, will be set down for presentation to a future meeting of the Society, and, on these, oral discussions, as well as written communications, will be solicited.

All papers which do not come under this heading, that is to say, those which from their mathematical or technical nature, in the opinion of the Committee, are not adapted to oral discussion, will not be scheduled for presentation to any meeting. Such papers will be published in the same manner as those which are to be presented at meetings, but written discussions only will be requested for subsequent publication in *Proceedings* and with the paper in the volumes of *Transactions*.

The Board of Direction has adopted rules for the preparation and presentation of papers, which will be found on page 36 of the Year Book for 1921.

LOCAL SECTIONS OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS

San Francisco Section (Constitution Approved by Board, 1905).

Frederick R. Muhs, President; H. D. Dewell, Secretary-Treasurer, *pro tem.*, 58 Sutter Street, San Francisco, Cal.

Bi-monthly meetings are held at 6 p. m., at the Engineers' Club, 57 Post Street, on the third Tuesday of February, April, June, August, October, and December, the last being the Annual Meeting. Informal luncheons are held at noon, every Wednesday, at the Engineers' Club. All members of the Society will be gladly welcomed.

Colorado Section (Constitution Approved by Board, 1909).

A. N. Miller, President; Walter L. Drager, Secretary-Treasurer, 412 Tramway Building, Denver, Colo.

Meetings are held on the second Monday of each month, except July and August, usually preceded by an informal dinner. Weekly luncheons are held on Wednesday, at 12.30 p. m., at Daniels and Fisher's. Visiting members of the Society are urged to attend.

Atlanta Section (Constitution Approved by Board, 1912).

J. T. Wardlaw, President; R. S. Fiske, Secretary-Treasurer, 1530 Healey Building, Atlanta, Ga.

Informal luncheons are held on the second Tuesday of each month, at 1.00 p. m., at the Ansley Hotel, to which visiting members of the Society are welcome. Visitors desiring information will telephone the Secretary, "Ivy 3605."

Baltimore Section (Constitution Approved by Board, 1914).

Ezra B. Whitman, President; George S. Robertson, Sr., Secretary-Treasurer, 1628 Linden Avenue, Baltimore, Md.

Buffalo Section (Constitution Approved by Board, 1921).

A. L. Johnson, President; Bruce L. Cushing, Secretary-Treasurer, 80 West Genesee Street, Buffalo, N. Y.

Central Ohio Section (Constitution Approved by Board, 1921).

F. H. Eno, President; H. D. Bruning, Secretary, 935 Madison Avenue, Columbus, Ohio.

Meetings are held at the rooms of the Engineers' Club of Columbus in the Southern Hotel. The Annual Meeting is held on the second Friday of

November and at least two other meetings are held each year the dates of which are designated by the Board of Direction of the Section.

Cincinnati Section (Constitution Approved by Board, 1920).

Edgar Dow Gilman, President; Alphonse M. Westenhoff, Secretary, 13 East Third Street, Cincinnati, Ohio.

Cleveland Section (Constitution Approved by Board, 1915).

J. E. A. Moore, President; George H. Tinker, Secretary-Treasurer, 516 Columbia Building, Cleveland, Ohio.

Regular meetings are held on the second Wednesday of each month, at 12.15 p. m., in the rooms of the Section, Hotel Winton. Luncheon is served, and all visiting members of the Society are invited to attend.

Connecticut Section (Constitution Approved by Board, 1919).

Charles Rufus Harte, President; Clarence M. Blair, Secretary-Treasurer, 785 Edgewood Avenue, New Haven, Conn.

The Annual Meeting is held in April; fortnightly meetings alternate between Hartford and New Haven, Conn. These meetings are informal luncheon gatherings, held usually at noon on Saturday. Members are privileged to invite guests regardless of their affiliation as engineers.

Detroit Section (Constitution Approved by Board, 1916).

David A. Molitor, President; Dalton R. Wells, Secretary-Treasurer, 624 McKerchey Building, Detroit, Mich.

Regular meetings are held on the second Friday of December, April, and October, the last being the Annual Meeting.

District of Columbia Section (Constitution Approved by Board, 1916).

John C. Hoyt, President; James H. Van Wagenen, Secretary-Treasurer, 2001 Sixteenth Street, N. W., Washington, D. C.

Duluth Section (Constitution Approved by Board, 1917).

John L. Pickles, President; Walter G. Zimmermann, Secretary, 203 Wolvin Building, Duluth, Minn.

Regular meetings are held at noon on the third Monday of each month, usually at the Kitchi Gammi Club, to which visiting members of the Society will be welcomed. The Annual Meeting is held on the third Monday in May.

Illinois Section (Constitution Approved by Board, 1916).

Charles B. Burdick, President; W. D. Gerber, Secretary-Treasurer, 918 Chamber of Commerce, Chicago, Ill.

Regular meetings are held on the second Monday of March, June, September, and December, the last being the Annual Meeting.

Iowa Section (Constitution Approved by Board, 1920).

C. S. Nichols, President; R. W. Crum, Secretary, Care, Iowa State Highway Commission, Ames, Iowa.

Los Angeles Section (Constitution Approved by Board, 1913).

H. W. Dennis, President; Floyd G. Dessery, Secretary, 619 Central Building, Los Angeles, Cal.

Regular monthly meetings are held on the second Wednesday of each month, the Annual Meeting in December. Informal luncheons in connection

with the Joint Technical Societies of Los Angeles are held at 12.15 p. m., every Thursday at the Broadway Department Store Café.

Louisiana Section (Constitution Approved by Board, 1914).

Ole K. Olsen, President; F. A. Muth, Secretary, 224 Custom House Building, New Orleans, La.

Regular meetings are held at The Cabildo, New Orleans, La., on the first Monday of January, April, July, and October.

Nashville Section (Constitution Approved by Board, 1921).

Arthur J. Dyer, President; Granbery Jackson, Secretary-Treasurer, 220 Capitol Boulevard, Nashville, Tenn.

Nebraska Section (Constitution Approved by Board, 1917).

Rodman M. Brown, President; Homer V. Knouse, Secretary-Treasurer, 200 City Hall, Omaha, Nebr.

Regular meetings are held on the first Saturday of each month, except July and August. The Annual Meeting is held in Lincoln, Nebr., on the second Friday in January. Visiting members of the Society are especially urged to communicate with the Secretary when in the city.

New York Section (Constitution Approved by Board, 1920).

Nelson P. Lewis, President; J. P. J. Williams, Secretary, 33 West 39th Street, New York City.

Regular meetings are held in the Engineering Societies Building, 29 West 39th Street, New York City, on the third Wednesday of each month, except January and the Annual Meeting in May, held on the second Wednesday of the month.

Northwestern Section (Constitution Approved by Board, 1914).

Charles L. Pillsbury, President; Paul C. Gauger, Secretary, 945 Osceola Avenue, St. Paul, Minn.

Meetings are held bi-monthly, alternating between St. Paul and Minneapolis, on the third Friday of each month.

Oklahoma Section (Constitution Approved by Board, 1920).

H. V. Hinckley, President; R. E. Brownell, Secretary-Treasurer, 401 First National Bank Building, Oklahoma, Okla.

Philadelphia Section (Constitution Approved by Board, 1913).

John Meigs, President; S. C. Hollister, Secretary, 1200 Land Title Building, Philadelphia, Pa.

Regular meetings are held at the Engineers' Club on the first Monday in January, April, and October, the last being the Annual Meeting. Special meetings are also held at times announced in advance.

Pittsburgh Section (Constitution Approved by Board, 1918).

N. S. Sprague, President; Nathan Schein, Secretary-Treasurer, 1510 Carson Street, Pittsburgh, Pa.

Portland (Ore.) Section (Constitution Approved by Board, 1913).

M. E. Reed, President; C. P. Keyser, Secretary, 318 City Hall, Portland, Ore.

Meetings are held regularly on the third Friday of each month. All members of the Society in any grade are cordially invited to attend.

Providence (R. I.) Section (Constitution Approved by Board, 1920).

Sydney Wilmot, Chairman; Robert L. Bowen, Secretary-Treasurer, 26 Sycamore Street, Providence, R. I.

The Section regularly holds meetings jointly with the Structural and Municipal Sections of the Providence Engineering Society, at the Society Rooms, 29 Waterman Street, on the fourth Tuesday of each month, from September to May. The Annual Meeting is held in May. All visiting members of the Society are cordially invited to attend these meetings.

St. Louis Section (Constitution Approved by Board, 1914).

William S. Mitchell, President; W. R. Crecelius, Secretary-Treasurer, 301 City Hall, St. Louis, Mo.

The Annual Meeting is held on the fourth Monday in November. Two meetings each year for the presentation and discussion of technical papers are held in the Auditorium of the Engineers' Club, and are open to members of the Associated Societies. Other "get-together" meetings are held regularly for dinner or luncheon on the fourth Monday of each month except July, August, and November.

San Diego Section (Constitution Approved by Board, 1915).

F. J. Grumm, President; J. Y. Jewett, Secretary-Treasurer, Administration Building, Balboa Park, San Diego, Cal.

The San Diego Section of the American Society of Civil Engineers meets on announcement. Pilgrimages to points of engineering interest are made at intervals throughout the year.

Seattle Section (Constitution Approved by Board, 1913).

T. E. Phipps, President; Frank H. Fowler, Secretary-Treasurer, 1319 L. C. Smith Building, Seattle, Wash.

Regular meetings, with luncheon, are held at the Engineers' Club, on the last Monday of each month. All members in any grade of the Society are cordially invited to attend, and if located in this District for any length of time, their membership in the Section will be appreciated.

Spokane Section (Constitution Approved by Board, 1914).

E. G. Taber, President; Charles E. Davis, Secretary-Treasurer, 401 City Hall, Spokane, Wash.

Meetings are held on the second Friday of each month. These meetings are noonday luncheons at Davenport's, and all visiting members of the Society are invited to attend.

Texas Section (Constitution Approved by Board, 1913).

J. H. Brillhart, President; E. N. Noyes, Secretary, 1107 Dallas County Bank Building, Dallas, Tex.

Utah Section (Constitution Approved by Board, 1916).

W. R. Armstrong, President; H. S. Kleinschmidt, Secretary-Treasurer, 222 Felt Building, Salt Lake City, Utah.

The Annual Meeting is held on the first Wednesday in April. The time of other meetings is not fixed, but this information will be furnished on application to the Secretary.

**STUDENT CHAPTERS OF THE
AMERICAN SOCIETY OF CIVIL ENGINEERS***

Leland Stanford, Jr., University Student Chapter, Organized 1920.

R. L. Wing, President; John H. Colton, Corresponding Secretary, Box 121, Stanford, Cal.

Alabama Polytechnic Institute Student Chapter, Organized 1921.

Alfred D. Boyd, Secretary, Alabama Polytechnic Institute, Auburn, Ala.

Braune Civil Engineering Society (University of Cincinnati) Student Chapter, Organized 1920.

Clinton H. Wood, President; H. J. Miller, Secretary of Section I; Alvord C. Stutson, Secretary of Section II; University of Cincinnati, Cincinnati, Ohio.

California Institute of Technology Student Chapter, Organized 1921.

J. Arthur Macdonald, Secretary, California Institute of Technology, Pasadena, Cal.

Civil Engineering Society of Rensselaer Polytechnic Institute Student Chapter, Organized 1920.

E. C. Larson, President; T. W. Broughton, Secretary, 2165 Fourteenth Street, Troy, N. Y.

Cornell University Student Chapter, Organized 1921.

John J. Chavanne, Jr., Secretary, Cornell University, Ithaca, N. Y.

Drexel Institute Student Chapter, Organized 1920.

Miles N. Clair, Chairman; Raymond Radbill, Secretary, Drexel Institute, Philadelphia, Pa.

Iowa State College Student Chapter, Organized 1920.

Alfred W. Warren, Secretary, Iowa State College, Ames, Iowa.

Johns Hopkins University Student Chapter, Organized 1921.

Eric M. Arndt, President; Melvin E. Scheidt, Secretary, Box 566, Homewood, Baltimore, Md.

Massachusetts Institute of Technology Student Chapter, Organized 1921.

D. H. McCreery, President; T. S. Wray, Secretary, Massachusetts Institute of Technology, Cambridge, Mass.

New York University Student Chapter, Organized 1921.

William J. Kiehnle, President; George H. Martin, Jr., Secretary, New York University, University Heights, New York City.

Oregon State Agricultural College Student Chapter, Organized 1921.

John B. Alexander, Secretary, Omega Upsilon House, Oregon State Agricultural College, Corvallis, Ore.

Pennsylvania State College Student Chapter, Organized 1920.

Arthur H. McFadden, President; William W. Seltzer, Secretary, Pennsylvania State College, State College, Pa.

* By a recent ruling of the Board of Direction, the minimum membership of a Student Chapter has been fixed at 12 instead of 20.

Polytechnic Institute of Brooklyn Student Chapter, Organized 1921.

Richard Kanegsberg, Secretary, Polytechnic Institute of Brooklyn, Brooklyn, N. Y.

Purdue University Student Chapter, Organized 1921.

Donald A. Leach, President, 208 Fowler Avenue, West Lafayette, Ind.

Rose Polytechnic Institute Student Chapter, Organized 1921.

Kenneth L. De Blois, President; Duncan Baker, Secretary, 1606 North Eighth Street, Terre Haute, Ind.

Rutgers College Student Chapter, Organized 1921.

L. C. Kuhl, President; A. C. Ely, Secretary, 105 Winants Hall, Rutgers College, New Brunswick, N. J.

State University of Iowa Student Chapter, Organized 1921.

C. E. Stickney, Secretary, State University of Iowa, Iowa City, Iowa.

Swarthmore College Student Chapter, Organized 1921.

Edward E. Bartleson, Secretary, Swarthmore College, Swarthmore, Pa.

Syracuse University Student Chapter, Organized 1921.

Arthur V. Dollard, Secretary, College of Applied Science, Syracuse University, Syracuse, N. Y.

University of California Student Chapter, Organized 1921.

H. G. Gerdes, Secretary, Care, Prof. Charles Derleth, Jr., College of Civil Engineering, University of California, Berkeley, Cal.

University of Colorado Civil Engineering Society Student Chapter, Organized 1920.

W. C. Peterson, President; D. H. McNeal, Secretary, 1205 Thirteenth Street, Boulder, Colo.

University of Illinois Student Chapter, Organized 1921.

A. L. R. Sanders, President; M. E. Jansson, Secretary, University of Illinois, Urbana, Ill.

University of Kansas Student Chapter, Organized 1921.

Waldo G. Bowman, Secretary, 1106 Ohio Street, Lawrence, Kans.

University of Kentucky Student Chapter, Organized 1921.

B. O. Bartee, Secretary, University of Kentucky, Lexington, Ky.

University of Maine Student Chapter, Organized 1921.

George H. Ferguson, Jr., Secretary, University of Maine, Orono, Me.

University of Pennsylvania Student Chapter, Organized 1920.

Charles W. Foppert, President; Fred Welch, Secretary, University of Pennsylvania, Philadelphia, Pa.

University of Pittsburgh Student Chapter, Organized 1921.

W. E. Marshall, President; Paul H. Young, Secretary, University of Pittsburgh, Pittsburgh, Pa.

University of Texas Student Chapter, Organized 1921.

W. H. D. Taylor, President; Phil M. Ferguson, Secretary, 511 West 19th Street, Austin, Tex.

University of Washington Student Chapter, Organized 1921.

G. B. Richardson, President; Grace Eugenie Morrill, Secretary, University of Washington, Seattle, Wash.

University of Wisconsin Student Chapter, Organized 1921.

Herbert Wheaton, President; Olaf N. Rove, Secretary, University of Wisconsin, Madison, Wis.

Virginia Military Institute Student Chapter, Organized 1921

Benjamin F. Parrott, Secretary, Virginia Military Institute, Lexington, Va.

Washington University Collimation Club Student Chapter, Organized 1920.

William D. Rolfe, President; Erwin Bloss, Secretary, Washington University, St. Louis, Mo.

Yale University Student Chapter, Organized 1921.

W. G. Geile, President; P. W. Thompson, Secretary, Winchester Hall, New Haven, Conn.

**PRIVILEGES OF ENGINEERING SOCIETIES
EXTENDED TO MEMBERS OF THE
AMERICAN SOCIETY OF CIVIL ENGINEERS**

Members of the American Society of Civil Engineers will be welcome in the Reading Rooms and at the meetings of many engineering societies in all parts of the world. A list of such societies will be found on pages 48, 49, and 50 of the Year Book of the Society for 1921.

NEW BOOKS*

(From September 1st to September 30th, 1921)

The statements made in these notices are taken from the books themselves, and this Society is not responsible for them.

DONATIONS TO ENGINEERING SOCIETIES LIBRARY

ALTERNATING CURRENTS.

By Carl Edward Magnusson. Second Edition. N. Y. and Lond., McGraw-Hill Book Co., Inc., 1921. 559 pp., illus., 9 x 6 in., cloth. \$4.50.

A presentation of the fundamental principles of alternating-current phenomena, with illustrations of their application to industrial problems, intended to aid the student in gaining clear concepts of what actually takes place in alternating-current machinery, to explain the relations between the factors involved, and to express the physical facts in mathematical forms in such a manner that he shall understand the equations and be able to use them rationally in the solution of industrial problems.

INDUCTION MOTOR AND OTHER ALTERNATING-CURRENT MOTORS.

By B. A. Behrend. Second Edition, Revised and Enlarged. N. Y. and Lond., McGraw-Hill Book Co., Inc., 1921. 272 pp., ports., diagrams, 9 x 6 in., cloth. \$4.00.

This work appeared first in 1901 and is based on a series of lectures delivered at the University of Wisconsin during the preceding year. This second edition, twenty years later, has been expanded from 105 to 272 pages and thoroughly revised to represent the author's present opinions on its subject. The book is not meant to be encyclopedic. It is, in the words of the author, "essentially the work of an engineer, who has had the good fortune to have been actively associated with the art of electrical engineering through almost three decades and who has had a part in the development of the machines about which he writes". He thus addresses himself to his fellow-engineers, revealing the methods which he has followed in the design and construction of alternating-current motors, of which literally millions of horse-power were executed under his direction.

AMERICA'S POWER RESOURCES.

By Chester G. Gilbert and Joseph E. Pogue. N. Y., The Century Co., 1921. 326 pp., illus., 8 x 5 in., cloth. \$2.50.

An attempt to interpret the importance attaching to the energy resources, coal, oil, natural gas, and water-power, to point to the shortcomings in the way they are handled, to outline the changes in the administration of energy which are bound to come into play if due social and industrial progress is to be attained, and to indicate the avenues of advance along which constructive efforts should be applied. The material presented is largely the result of investigations by the authors, brought out from time to time as special papers, emanating mostly from the Division of Mineral Technology, United States National Museum, and more popularly presented here in a unified and less technical form.

POWER HOUSE DESIGN.

By Sir John F. C. Snell. Second Edition. (Electrical Engineering Series.) Lond. and N. Y., Longmans, Green & Co., 1921. 535 pp., illus., diagrams, tab., 9 x 6 in., cloth. \$14.00.

In preparing this book, the author has drawn on his own experience of more than twenty years and has collected and classified the experience of other engineers. The information thus acquired has been carefully sifted and condensed in the present volume, which the author believes to contain all the requisite practical information on its subject. The principles and information given cover the design and equipment of central stations and isolated plants for supplying light and power to cities, factories, mines, railroads, etc., and are accompanied by typical examples of modern installations. This edition has been thoroughly revised and to a considerable extent rewritten.

ELECTRIC FURNACE.

By J. N. Pring. (Monographs on Industrial Chemistry.) Lond. and N. Y., Longmans, Green & Co., 1921. 485 pp., pl., illus., 9 x 6 in., cloth. \$10.50.

Although the most noteworthy branches of the electro-chemical and electro-metallurgical industries have been described in a number of publications, the present rapid progress of these enterprises demands a frequent revision and extension of the literature. This volume is an additional contribution to the general technical discussion of the position and prospects of high-temperature industrial chemistry. The author reviews the history and principles of

*Unless otherwise specified, books in this list have been donated by the publishers.

the electric furnace and describes the types in use. Current supply, transformers and the measurement of high temperatures are treated and the use of the electric furnace in the metallurgy and chemistry of the important metals is described. Attention is also given to furnace design and to the economic aspects of electro-chemical processes. A useful bibliography is appended.

AUTOMATIC TELEPHONY.

By Arthur Bessey Smith and Wilson Lee Campbell. Second Edition. N. Y. and Lond., McGraw-Hill Book Co., Inc., 1921. 430 pp., illus., diagrams, 9 x 6 in., cloth. \$5.00.

The method adopted is to describe fully the typical circuits and apparatus of the Strowger type, and to outline briefly the other important systems. By this method it has been possible to explain the principles and methods fully enough for their application to other makes of equipment, without attempting to narrate the practice of all manufacturers in detail. This edition is radically changed from the previous one, by the elimination of obsolete matter and the introduction of new material.

E. M. F. ELECTRICAL YEAR BOOK.

Edited by Frank H. Bernhard. Annual Edition, 1921. Chic., Electrical Trade Publishing Co. 1406 pp., illus., 12 x 9 in., cloth. \$10.00.

This book is a combined encyclopedia, dictionary, and trade directory of the electrical industry, prepared by a large editorial staff, and containing a great amount of up-to-date information of the kind most sought by those connected with electrical enterprises or using electricity. The volume is arranged alphabetically and is a convenient reference book on matters of theoretical, technical, and industrial interest.

WHITTAKER'S ELECTRICAL ENGINEER'S POCKET-BOOK.

Edited by R. E. Neale. Fourth Edition. Lond. and N. Y., Sir Isaac Pitman & Sons, Ltd., 1920. 671 pp., illus., 6 x 4 in., cloth. \$4.00.

This edition, the first in nine years, has been entirely rewritten. Its scope has been materially extended and the assistance of several specialists secured in order that the treatment of each subject might accord with the latest practice. Although covering the range of matter and having the convenience of reference commonly expected from a pocket-book, the book is intended, also, to furnish an up-to-date synopsis of each subject which will have the coherency and wealth of detail usually found only in textbooks, so that the volume may be equally useful for systematic reading and for reference. The field covered is broadly that of industrial electrical engineering.

AEROPLANE PERFORMANCE CALCULATIONS.

By Harris Booth. (The Directly-Useful Technical Series.) N. Y., E. P. Dutton & Co., 1921. 207 pp., diagrams, 9 x 6 in., cloth. \$8.00.

This book, it is hoped, will meet the need of aeronautical engineers and designers for a practical method of calculation. The subject-matter is in three sections: First, a descriptive and theoretical section explaining the points to be noticed and deriving the necessary formulas; second, an explanation of practical procedure; and third, an example of the application of the method to an actual machine.

THERMODYNAMICS.

By J. E. Emsweiler. N. Y. and Lond., McGraw-Hill Book Co., Inc., 1921. 266 pp., diagrams, 9 x 6 in., cloth. \$3.00.

An attempt to present the subject progressively so that the reader may easily recognize the relation of each new demonstration to the whole. For this purpose the order of presentation is changed from that generally used. Steam is placed first, followed by vapor refrigeration, after which the permanent gases, mixtures, and air heat engines are studied. Formal discussion of the laws of thermodynamics and the kinetic theory of gases is postponed until the close of the book.

OIL FLOW IN PIPE LINES.

By R. S. Danforth. San Fran., King, Knight Co., 1921. 12 pp., charts, 9 x 12 in., paper. \$3.00.

These charts have been compiled to facilitate the solution of problems in oil pumping. They are derived from the formulas and method of computation used by the author in his monograph entitled "Friction Losses in Oil Pipe Lines" and are based on the law of the flow of liquids in pipe lines deduced at the National Physical Laboratory of Great Britain. The charts will apply to the flow of any liquid or gas in cases where the inside surface of the pipe is of the roughness ordinarily found in oil pipe lines.

BROWN'S DIRECTORY OF AMERICAN GAS COMPANIES.

1921 Edition. N. Y., Robbins Publishing Co., Inc. 1090 pp., illus., 12 x 9 in., cloth. \$10.00.

The first section of this work contains condensed catalogues of the principal manufacturers of gas equipment, appliances, and supplies, standardized as to form and style and comprehensively indexed. The second section gives technical and commercial gas company

statistics, arranged alphabetically by States and cities, including plants supplying cities and towns, by-product coke oven plants, natural gas companies, holding and operating companies, etc. More than 1,800 plants are included. Other sections give financial reports for 332 companies in the principal cities, lists of gas associations, and a directory of association members. The volume covers North, Central and South America and the West Indies.

UNION ENGINEERING HANDBOOK;

Pumping Machinery, Air Compressors, Condensers. Compiled by E. P. Ordway. Battle Creek, Mich., Union Steam Pump Co., 1921. 442 pp., illus., 9 x 5 in., cloth. \$2.00.

Intended for engineers, architects, and others interested in air compressors, condensers and steam, centrifugal, power, and vacuum pumps. Contains the engineering information and data usually desired in calculating the problems encountered in handling these machines, with special information on the products of the company which publishes the book.

WIRTSCHAFTLICHES SCHLEIFEN.

Compiled by G. Schlesinger. Berlin, Julius Springer, 1921. 103 pp., illus., 12 x 9 in., paper. 24 marks.

A collection of essays on grinding machines and processes, based on German and American shop practice, and intended to call attention to the advantages of grinding, its use for various purposes, and the machines and methods used. The articles first appeared in Vols. 11 to 15 of "Werkstatstechnik".

DER 1 000 PS FLUGMOTOR.

By Edmund Rumpler. München, R. Oldenbourg, 1921. 63 pp., pl., 21 x 10 in., cloth. 50 marks.

Present-day aviation engines are, according to this monograph, only lighter automobile engines, constructed in almost every case by automobile engineers without special knowledge of the problems of flight. The engine here described is designed to meet the peculiar conditions of flight and overcome the deficiencies of the engines hitherto used. The text and drawings illustrate a 1,000-h. p. engine, a combination of the radial and horizontal arrangement of cylinders, having four sets of seven radial cylinders.

THEORIE UND WIRKLICHKEIT BEI TRIEBWERKEN UND BREMSEN.

By St. Löffler. München und Berlin, R. Oldenbourg, 1919. 94 pp., 9 x 6 in., paper. 5.50 marks.

This small volume contains the author's answers to various criticisms of the theory advanced by him in his earlier volume entitled "Mechanische Triebwerke und Bremsen". The various objections to his former assertions are met and answered in detail.

CONCENTRATION BY FLOTATION.

Compiled and Edited by T. A. Rickard. N. Y., John Wiley & Sons, Inc.; Lond., Chapman & Hall, Ltd., 1921. 692 pp., illus., diagrams, 9 x 6 in., cloth. \$7.00.

This book is a compilation of forty articles which appeared in the *Mining and Scientific Press* during the years 1915 to 1920. Twenty-two of these articles have already been reprinted in "The Flotation Process" or "Flotation", two previous compilations; the remainder appear for the first time in book form. The book does not pretend to be a comprehensive treatise on flotation, but is intended to provide a convenient compendium of the principal literature on the technology of the process, which may be helpful to those engaged in using and developing it.

THE METALLURGY OF THE COMMON METALS.

By Leonard S. Austin. Fifth Edition, Revised and Enlarged. N. Y., John Wiley & Sons, Inc.; Lond., Chapman & Hall, Ltd., 1921. 615 pp., illus., 9 x 6 in., cloth. \$7.00.

This is an outline of the processes in general use for winning the common metals from their ores and refining them. Following the description of ores, fuels, and furnace materials, the methods of sampling and preparing ores are explained and an account is given of the principles of thermo-chemistry as applied to igneous methods of extraction. The winning or reduction of each metal and the method for refining it is then described. Pains have been taken to give the underlying principles, as well as the details of methods and equipment and their cost. A chapter is devoted to the economic situation of metallurgical industries.

YEAR BOOK OF THE AMERICAN BUREAU OF METAL STATISTICS.

Annual Issue; 1920. 62 pp., tab., 10 x 8 in., paper.

This book, prepared under the direction of W. R. Ingalls, was designed to be a compilation of the statistics of the production, consumption, and commercial movements of copper, lead, and zinc in the principal countries of the world, covering, in general, the last ten years. The figures given are taken from the best available Government and commercial sources, and great care has been taken to insure accuracy. The countries included are the United States, Great Britain, France, Belgium, Sweden, Italy, and Japan.

MINE ACCOUNTING AND COST PRINCIPLES.

By T. O. McGrath. N. Y. and Lond., McGraw-Hill Book Co., Inc., 1921. 257 pp., tab., 9 x 6 in., cloth. \$4.00.

The method of accounting presented in this book is based, in the author's opinion, on the correct basis, and can be used in accounting and cost procedure in any mine, regardless of operating methods or the character of the ores, thus allowing uniformity in practice. The principles of the method are stated fully in the book, and sufficient forms, charts, records, and instructions are given to illustrate how the principles are applied in practice.

THE ECONOMIC ASPECTS OF GEOLOGY.

By C. K. Leith. N. Y., Henry Holt & Co., copyright 1921, 457 pp., 9 x 6 in., cloth. \$4.50.

The purpose of this book is to indicate and illustrate, in some perspective, the general nature of the application of geology to practical affairs, without exhaustive discussion of the principles of geology which are involved. It attempts to explain the nature of the economic demands for the science of geology, and to discuss something of the philosophy of the finding and use of raw materials.

OUTLINES OF GEOLOGIC HISTORY,

With especial Reference to North America. Symposium Organized by Bailey Willis. Compilation Edited by Rollin D. Salisbury. Chic., Univ. of Chicago Press. 306 pp., illus., 9 x 6 in., cloth. \$1.65.

These essays, which have appeared in the *Journal of Geology*, are now collected in book form. They present, in broad outlines, a summary of the present state of knowledge and opinion concerning many of the fundamental problems of North American geology. Fifteen paleographic maps by Bailey Willis are included.

A TEXTBOOK OF GEOLOGY.

By Amadeus W. Grabau. Part 2: Historical Geology. N. Y., D. C. Heath & Co., copyright 1921. 976 pp., illus., 9 x 6 in., cloth. \$6.00.

This volume of Dr. Grabau's treatise is devoted to historical geology. The treatment is a departure from that usually followed in textbooks of this class, emphasis being placed on stratigraphic, rather than biologic, development. The latter, although not neglected, has been mainly segregated in special chapters. The chapters dealing with the systems are uniform in plan. After a brief historical consideration, several characteristic sections are described. Then the stratigraphic development in America and Europe is discussed, and the relationship of the formations at the time of formation and the geographic conditions which determined their distribution and character are shown. Although prepared for college classes, the book is also intended as a reference text.

FAMOUS CHEMISTS.

By Sir William A. Tilden. Lond., G. Routledge & Sons, Ltd.; N. Y., E. P. Dutton & Co., 1921. 296 pp., ports., 9 x 6 in., cloth. \$5.00.

Sir William Tilden has sketched the lives of some of the most prominent chemists of the past, in a style suitable for general reading. The guiding principle of his selection of subjects has been the evolution of the atomic theory, and he has limited the book to men whose discoveries have been indispensable to progress along that line.

A DICTIONARY OF APPLIED CHEMISTRY.

By Sir Edward Thorpe. Vol. 2. Revised and Enlarged Edition. Lond. and N. Y., Longmans, Green and Co., 1921. 717 pp., illus., 9 x 6 in., cloth. \$20.00.

The second volume of this welcome revision of the standard reference work in English on applied chemistry to appear during 1921 carries the work to the subject of Explosives. Under the direction of Sir Edward Thorpe, the work has been done by a long list of competent authorities, who have signed all the longer articles. The work, when complete, promises to be about one-third larger than before.

ANALYTIC GEOMETRY, WITH INTRODUCTORY CHAPTER ON THE CALCULUS.

By Claude Irwin Palmer and William Charles Krathwohl. N. Y. and Lond., McGraw-Hill Book Co., Inc., 1921. 347 pp., 8 x 5 in., cloth. \$2.50.

The object of this book is to present analytic geometry to the student in as natural and simple a manner as possible without losing mathematical rigor. It is based on the course given at the Armour Institute of Technology.

A FIRST COURSE IN ANALYTICAL GEOMETRY.

By Charles N. Schmall. Second Edition, Enlarged. N. Y., D. Van Nostrand Co., 1921. 338 pp., 8 x 5 in., cloth. \$2.25.

A course of moderate scope, designed for use in colleges and scientific schools, and as an introduction to advanced courses.

INDUSTRIAL MATHEMATICS PRACTICALLY APPLIED.

By Paul V. Farnsworth. N. Y., D. Van Nostrand Co., 1921. 272 pp., illus., tables, 8 x 5 in., cloth. \$2.50.

A textbook prepared by an instructor of apprentices who has also had practical shop experience. Every effort has been made to simplify the path for the beginner and to provide problems that are practical and stimulating.

VOLUMETRIC ANALYSIS.

By Charles H. Hampshire. Third Edition. Phila., P. Blakiston's Son & Co., 1921. 124 pp., 8 x 5 in., cloth. \$1.75.

A brief general course for beginners, to which an additional course for students of pharmacy is added. It is intended to enable the student to proceed to the use of larger works on special branches.

COLORIMETRIC ANALYSIS.

By F. D. Snell. N. Y., D. Nostrand Co., 1921. 150 pp., illus., 8 x 6 in., cloth. \$2.00.

A reference book for the analytical chemist, containing all the colorimetric tests that the author believes of practical value.

CRAIN'S MARKET DATA BOOK AND DIRECTORY

Of Class, Trade, and Technical Publications, 1921. Chicago, G. D. Crain, Jr. 462 pp., 9 x 6 in., cloth. \$5.00.

This new directory should prove useful to advertisers and others who wish lists of American and Canadian periodicals covering various lines. The information given is grouped under the various trades, professions, and industries, arranged alphabetically. Each section opens with a concise statement concerning the industry, showing its size, annual expenditures and receipts, interests, etc. This is followed by a list of the journals covering the class, in which subscription prices, circulation, and advertising rates are given. Indexes to the classification and the journals are given.

DAVISON'S TEXTILE "BLUE BOOK", UNITED STATES AND CANADA.

Thirty-fourth Annual Edition, July, 1921 to July, 1922. Handy Edition. N. Y., Davison Publishing Co. 1584 pp., 8 x 5 in., cloth. \$5.00.

This directory covers very thoroughly the textile industry of North America in all its branches, including mills, dye houses, dealers, and supply merchants. Details concerning the ownership, size, and products are given for each mill. The contents are classified under twenty-one headings, for convenient reference. The present edition has been carefully revised and includes 708 new manufacturers.

MACRAE'S BLUE BOOK:

Vol. 12, 1921. Chic. and N. Y., McRae's Blue Book Co. 1680 pp., 11 x 9 in., cloth. \$10.00.

This guide for buyers contains a collection of condensed catalogues, a list of manufacturers with their addresses, a classified list of materials with their manufacturers, an index of trade names, and a collection of data needed by purchasing agents. Thirty thousand manufacturers are included, classified under 16 000 subjects. The Directory is intended especially for buyers of railway supplies, iron and steel, and building material.

ETUDE DES MOUVEMENTS APPLIQUÉE.

By Frank B. Gilbreth and L. M. Gilbreth. Paris, Dunod, 1921. 161 pp., 8 x 5 in., paper. (Gift of the Authors.)

In 1918, Mr. Gilbreth's "Motion Study" appeared in French. Evidently, it attracted interest, for it is now followed by a translation of "Applied Motion Study", a collection of papers by Mr. and Mrs. Gilbreth which was published in this country in 1919. The publication of the book is an indication of the keen interest of French engineers and manufacturers in American methods of production.

STATIQUE DYNAMIQUE.

By M. Stuyvaert. Gand, Van Rysselberghe & Rombaut, 1920. 205 pp., diagrs., 9 x 6 in., paper. 20 francs.

An elementary treatise on mechanics intended for engineering students. By the omission of those mathematical developments that have no practical value to the engineer, the author has produced a book of modest dimensions, well adapted to teach the subject in a minimum number of lessons.

GRUNDLAGEN UND GERÄTE TECHNISCHER LANGENMESSUNGEN.

By G. Berndt and H. Schulz. Berlin, Julius Springer, 1921. 216 pp., illus., 10 x 6 in., paper. 48 marks.

This discussion of the principles on which our measurements of length rest and the instruments used for measurement is intended for engineers and machinists engaged in

manufacturing industries. The book first explains the development of the metric system, the standard meter, and the methods of reproducing it. The development of industrial measures and gauges is then described fully, their exactness discussed, and the physiological errors that occur are explained.

RAILROAD SHOP PRACTICE.

By Frank A. Stanley. N. Y. and Lond., McGraw-Hill Book Co., Inc., 1921. 331 pp., illus., 9 x 6 in., cloth. \$4.00.

The purpose of this book is to show typical methods and appliances as adapted to the work of various railroad repair shops, large, medium, and small, situated in different parts of the United States. Much of the material presented has been taken from the articles by the author and others in technical journals, but considerable of it is new.

PRACTICAL TRACK MAINTENANCE.

By Kenneth L. Van Auken. Second Edition. Chic., Railway Educational Press, Inc., 1921. 274 pp., illus., 8 x 5 in., cloth. \$2.50.

Van Auken's book is designed to cover the essentials of routine section work, as approved by practical track men of varied experience. It is adapted, therefore, for use as a guide in the everyday work of the foreman or supervisor. The second edition is apparently an unchanged reprint of the first.

CONCRETE WORK.

By William Kendrick Hatt and Walter C. Voss. Vol. 2. N. Y., John Wiley & Sons, Inc.; Lond., Chapman & Hall, Ltd., 1921. 206 pp., illus., 8 x 5 in., cloth. \$2.00.

The second volume of this practical textbook is a systematic course in the application of the fundamentals of concrete work, as set forth in Vol. 1, to a series of representative examples. The complete work forms an unusually practical course in concrete construction.

A. S. T. M. STANDARDS, 1921.

Phila., American Society for Testing Materials. 890 pp., illus., 9 x 6 in., cloth. \$10.00.

The 1921 volume of standards contains the specifications and methods of testing approved by the Society. These number 160, and have to do with a variety of materials—ferrous and non-ferrous metals, cement, lime, gypsum and clay products, preservative coatings, road materials, coal and coke, timber, timber preservatives, etc. Nearly one-half of the standards have been revised since the last edition appeared, or are new.

ELEMENTS OF SPECIFICATION WRITING.

By Richard Shelton Kirby. Second Edition, Revised. N. Y., John Wiley & Sons, Inc.; Lond., Chapman & Hall, Ltd., 1921. 153 pp., 9 x 6 in., cloth. \$1.50.

This is a textbook on the art of specification writing, not a collection of specifications. It is based on the course given by the author in the Sheffield Scientific School of Yale University. The revision has been made with the purpose of modernizing the book and of making it more useful for those outside the Profession of Civil Engineering.

MEMBERSHIP

(From September 6th to October 4th, 1921)

ADDITIONS

MEMBERS	Date of Membership
AUSTIN, FRANK WILLIS. City Engr., 506 West 1st St., Chanute, Kans.....	Assoc. M. Mar. 5, 1912 M. Sept. 12, 1921 Jun. Feb. 28, 1911
BLIGHT, ARTHUR FREDERICK. Res. Engr., Southern California Edison Co., Big Creek, Cal.....	Assoc. M. Jan. 6, 1915 M. Sept. 12, 1921 Jun. Nov. 1, 1904
BREUCHAUD, JULES ROWLEY. (Underpinning & Foundation Co.), 290 Broadway, New York City.....	Assoc. M. May 2, 1911 M. April 26, 1921
CLARKSON, WALTER LEAKE. Archt., 905 Ave. C., Bayonne, N. J....	Sept. 12, 1921
DYER, JOHN, JR. Contr. and Builder, 17 Steuben St., Room 30, Albany, N. Y.....	Sept. 12, 1921
ELSTON, ALLAN VAUGHN. Cons. Engr. (Elston, Axon & Russell), 404 McDaniel Bldg., Springfield, Mo.....	Assoc. M. April 14, 1919 M. Sept. 12, 1921
FLOYD, OZRO NOWLIN. Div. Engr., Miami Conservancy Dist., Vandalia, Ohio.....	Assoc. M. Sept. 3, 1913 M. Sept. 12, 1921
GRiffin, JOHN ALDEN. City Engr., 5125 Woodlawn Ave., Los Angeles, Cal.....	Assoc. M. July 9, 1912 M. Sept. 12, 1921
GROSS, CHARLES FREDERICK. Civ. Engr., Wm. Steel & Sons Co., 1600 Arch St., Philadelphia, Pa.....	Assoc. M. Sept. 2, 1908 M. Sept. 12, 1921
HAINES, WILLIAM LAWRENCE Ross. Asst. Engr., Pennsylvania System, 1126 Pennsylvania Station, Pittsburgh, Pa.....	Sept. 12, 1921
HARVEY, CLARKE KENNERLEY. Chargeman, U. S. Navy, U. S. Naval Ordnance Plant, South Charleston, W. Va.....	Assoc. M. May 3, 1910 M. Sept. 12, 1921
HATHAWAY, CLIFFORD MURRAY. Dist. Engr., Div. of Highways, Dept. of Public Works and Bldgs., Box 36, Effingham, Ill.....	Jun. Sept. 1, 1908 Assoc. M. Mar. 14, 1916 M. Sept. 12, 1921
LARSEN, PETER MAGNUS. Supt. of Constr., Widdell Eng. Co., Box 556, Chanute, Kans.....	Assoc. M. Jan. 14, 1918 M. Sept. 12, 1921
LEACH, THOMAS. Vice-Pres. and Chf. Engr., Bancroft Jones Corporation, 11 Hubbard St., Buffalo, N. Y.....	Jun. June 30, 1910 Assoc. M. Dec. 3, 1912 M. Sept. 12, 1921
LINTON, WALTER POWELL. Senior Highway Bridge Engr., U. S. Bureau of Public Roads, 410 Hamm Bldg., St. Paul, Minn.....	Assoc. M. June 6, 1911 M. Sept. 12, 1921
PATRICK, CHARLES GOODWIN. 307 Thorpe Bldg., Los Angeles, Cal.	Sept. 12, 1921
REINEKING, VICTOR HERMAN. Asst. Engr., Baar & Cunningham, 4832 Sixtieth St., S. E., Portland, Ore.....	Sept. 12, 1921
REYNOLDS, LEON BENEDICT. (Burns & McDonnell Eng. Co.), 402 Interstate Bldg., Kansas City, Mo....	Jun. Oct. 4, 1910 Assoc. M. Aug. 31, 1915 M. Sept. 12, 1921
SMITH, CHARLES ALFRED. Supt. of Roadway, Georgia Railway & Power Co., 318 Elec. and Gas Bldg., Atlanta, Ga.....	Sept. 12, 1921
TOZZER, ARTHUR CLARENCE. Vice-Pres. and Gen. Mgr., Turner Constr. Co., 178 Tremont St., Boston, Mass.....	Jun. April 4, 1905 Assoc. M. Feb. 28, 1911 M. Sept. 12, 1921

MEMBERS (*Continued*)

			Date of Membership.
TYLER, RICHARD GAINES.	Dean, School of Eng., Oklahoma Agri. and Mech. Coll., Stillwater, Okla.	Jun. Assoc. M. M.	Oct. 6, 1908 Nov. 3, 1915 Sept. 12, 1921
WEBSTER, ERNEST CHARLES.	Pres., Kamehameha Schools, Honolulu, Hawaii.....	Assoc. M. M.	Nov. 4, 1914 July 11, 1921
WELTON, ASHLEY JAY.	Pres. and Gen. Mgr., The United Contr. Co., 109 Northwestern Bank Bldg., Portland, Ore.....		Sept. 12, 1921
WHEAT, GEORGE NEVILLE.	4925 Montgall Ave., Kansas City, Mo.....	Assoc. M. M.	Jan. 4, 1910 Sept. 12, 1921
WOODS, HARLAND CLARK.	Acting Dean and Prof. of Civ. Eng., Robert Coll., Constantinople, Turkey	Jun. Assoc. M. M.	Feb. 28, 1911 May 7, 1913 July 11, 1921
ZEISLOFT, EARL ALDERFER.	Director and Chf. Engr., Dept. of Public Service, Delaware Bldg., Akron, Ohio	Assoc. M. M.	May 13, 1918 Sept. 12, 1921

ASSOCIATE MEMBERS

ANDERSON, LYTTLETON COOKE.	Asst. Gen. Mgr., Nashville Bridge Co., Nashville, Tenn.....		Sept. 12, 1921
BARCK, WILLIAM FRANK.	1129 Washington St., Hoboken, N. J....		Dec. 6, 1920
BEARD, ARTHUR GARFIELD.	Asst. Engr., City of Omaha, 4910 California St., Omaha, Nebr.....		Sept. 12, 1921
BETTES, RICHARD STOCKWELL.	266 Pearl St., Springfield, Mass....		Sept. 12, 1921
BLACKER, JOHN JOSEPH.	30 Albion St., Waterbury, Conn.....		April 25, 1921
BRASSEL, THOMAS MELVILLE.	Asst. Engr., Transit Constr. Commr. (Res., 943 Sherman Ave.), New York City.....		Sept. 12, 1921
COOK, FRANK BIGELOW, JR.	Structural Designer, Standard Oil Co., of San Francisco, 1831 Tenth Ave., Oakland, Cal.....		April 25, 1921
CULLETON, LEO GIULIO.	Capt., R. E.; Engr. and Mgr. for Italy and the Near East, Worthington Pump & Machinery Corporation of New York, No. 4, Via Dante, Milan, Italy.....		July 11, 1921
EVANS, WALTER HENRY.	Engr., William B. Ittner, 2734 Rutger St., St. Louis, Mo.....		Sept. 12, 1921
FISHER, HAROLD STUART.	Chf. of Party, Southern California Edison Co., Big Creek, Cal.....		Sept. 12, 1921
FUNDEBURK, JOSEPH VAN METER.	Pres. and Gen. Mgr., Monongahela Val. Eng. Co., Morgantown, W. Va.....		Sept. 12, 1921
GARDNER, FRANK.	Supt. of Constr., Stone & Webster, Inc., Apache, Okla.....		Sept. 12, 1921
GILKEY, HERBERT JAMES.	605 West Illinois St., Urbana, Ill.....		Sept. 12, 1921
GOODWYN, RICHARD TUGGLE, JR.	Div. Engr., State Highway Dept., Athens, Ga.....		Sept. 12, 1921
GRAY, JACOB MICHAEL.	Archt. and Engr., 38 Park Row, Room 1009, New York City (Res., Wayne and Waldo Aves., White Plains, N. Y.).....		April 25, 1921
GREENOUGH, PERCY JULIAN.	Engr., Woodhaven Water Supply Co., 4026 Ninety-first Ave., Woodhaven, N. Y.....	Jun. Assoc. M.	April 19, 1920 Sept. 12, 1921
HARRIS, THOMAS DEVIN.	County Highway Engr., Stanley County, Albermarle, N. C.....		Sept. 12, 1921

ASSOCIATE MEMBERS (*Continued*)

		Date of Membership.
HARRISON, CARTER HARRELL.	705 Sumpter Bldg., Dallas, Tex.	Sept. 12, 1921
HOLBROOK, EDWIN CHARLES.	Chf. Engr., Boston Office, Truscon Steel Co., 147 Summer St., Boston, Mass.	Sept. 12, 1921
JOHNSON, JOHN DANIEL.	Gen. Supt., W. C. Hedrick Constr. Co., Fort Worth, Tex.	Sept. 12, 1921
KEASBEY, HOWARD BUZBY.	(Keasbey & Sparks), Salem, N. J.	Sept. 12, 1921
KILCARR, GILBERT MICHAEL.	Cons. Engr., 25 Church St., New York City	Sept. 12, 1921
KNAPP, WILLARD ALFRED.	Associate Prof., Structural Eng., Pur- due Univ., 105 Fowler Ave., West Lafayette, Ind.	July 11, 1921
LINDSEY, HARRY.	Box 368, Helena, Mont.	Sept. 12, 1921
MCGREGOR, FLINT.	Bldg. Contr., 925 Mills Bldg., El Paso, Tex.	Sept. 12, 1921
MICHENER, HOWARD PERRY.	Asst. Engr., Public Serv- ice Comm. and Transit Constr. Comm., 49 Lafay- ette St., New York City (Res., Seaview Ave., Richmond, N. Y.)	Jun. Assoc. M. May 7, 1913 June 6, 1921
MORGAN, WALTER LLEWELLYN.	Prin. Asst. County Engr., Spokane County, 1628 East 10th Ave., Spokane, Wash.	Sept. 12, 1921
NELSON, NELS PETER.	Div. Engr., M. of W., C. B. & Q. R. R., Box 1129, Casper, Wyo.	Sept. 12, 1921
OLTMAN, JACOB OVERWIN.	Supt. of Constr., Wurster Constr. Co., 5311 Irvington Pl., Los Angeles, Cal.	July 11, 1921
OVERLAND, ARTHUR BURDETTE.	City Engr., Austin, Minn.	Sept. 12, 1921
PORTER, JOHN HART.	Asst. to Dist. Mgr., Woods Bros. Constr. Co., 2117 Railway Exchange Bldg., St. Louis, Mo.	Sept. 12, 1921
PUDDICOMBE, ALBERT BRUCE.	Asst. Engr., Public Works Dept., Shanghai Municipal Council, Shanghai, China	Jun. Assoc. M. Mar. 12, 1918 April 25, 1921
RICHARDS, GEORGE WILLIAM.	Field Engr., Am. Bridge Co., 1530 Frick Bldg., Pittsburgh, Pa.	Jun. Assoc. M. Sept. 2, 1914
RICHART, FRANK ERWIN.	Research Asst., Prof., Theoretical and Applied Mechanics, Univ. of Illinois, 300 Laboratory of Ap- plied Mechanics, Urbana, Ill.	Sept. 12, 1921
RIPLEY, JAMES HAZEN.	1140 Park Ave., New York City	Sept. 12, 1921
SEMSEN, ARTHUR ANDERSEN.	Senior Land Appraiser, Interstate Commerce Comm., 188 Fifteenth Ave., San Francisco, Cal.	June 6, 1921
SHELDON, FRANK LAWRENCE.	Care, F. P. Sheldon & Son, Hospital Trust Bldg., Providence, R. I.	June 6, 1921
SLEIGHT, REUBEN BENJAMIN.	Laingsburg, Mich.	Jun. Assoc. M. Dec. 6, 1915 April 25, 1921
SLOAN, CHARLES ELONZO.	Chf. Bridge Draftsman, B. & O. R. R., 2404 Guilford Ave., Baltimore, Md.	Sept. 12, 1921
SMITH, RAY REED.	Structural Engr., Interstate Commerce Comm., 40 Parnassus Ave., San Francisco, Cal.	Sept. 12, 1921
SOUTHGATE, JOHN MCKNIGHT.	City Engr., Rolla, Mo.	July 11, 1921
STEWART, FRANCIS BENJAMIN.	County Surv., Kahoka, Mo.	Sept. 12, 1921
STEWART, FRED JAMES.	Prin. Asst. Engr., M. G. Hall, Centerville, Iowa	Sept. 12, 1921
STRAIT, NOYCE WORSTALL.	Office Engr., Oakland County Road Comm., Pontiac, Mich.	Sept. 12, 1921

ASSOCIATE MEMBERS (*Continued*)Date of
Membership.

WADE, CLIFFORD LINWOOD. Engr., Albert B. Drake, 75 Sycamore St., New Bedford, Mass.....	Sept. 12, 1921
WORRELL, MAURICE EUGENE. Res. Engr., Bryant & Huffman, 410 Second St., Hillsboro, Tex.....	Sept. 12, 1921

JUNIORS

BERKE, STEVEN ROSS. Hotel Coolidge, Brookline, Mass.....	Sept. 12, 1921
BOWKER, ROY FRAZIER. Care, Southern Eng. Co., Realty Bldg., Charlotte, N. C.....	Sept. 12, 1921
COX, JOHN EDWIN. 4 Cottage St., Peabody, Mass.....	June 6, 1921
FRIEDENBERG, BENJAMIN. Hydrographic and Geodetic Engr., U. S. Coast and Geodetic Survey, Care, Director of Coast Surveys, Manila, Philippine Islands.....	July 11, 1921
HERRING, FRANCIS WILLIAM. 1820 Mosher St., Baltimore, Md.....	June 6, 1921
MOWER, LELAND MONROE. 202 Burke Bldg., Seattle, Wash.....	Sept. 12, 1921
PATTERSON, WILLIAM DARYL. Junior Hydrographic and Geodetic Engr., U. S. Coast and Geodetic Survey, Washington, D. C.....	Sept. 12, 1921
QUIRK, LOUIS FRANCIS. Cons. Engr., 491 High St., Middletown, Conn.	Sept. 12, 1921
SPIVAK, WILLIAM. 194 Thatford Ave., Brooklyn, N. Y.....	April 25, 1921
WALKER, WILLIAM OLIN. Cost Engr., Sinclair Refining Co., 111 West Washington St., Chicago, Ill.....	Mar. 7, 1921
WENTWORTH, CHARLES RUSCHENBERGER. Asst. Contr. Engr., Virginia Bridge & Iron Co., 914 Jefferson St., Roanoke, Va.....	Sept. 12, 1921
WILSON, PERCY SUYDAM. Draftsman, James H. Fuertes, 28 Woodland Ave., Glen Ridge, N. J.....	Sept. 12, 1921

DEATHS

BROWNE, JAMES GIBBONS. Elected Associate Member, May 6th, 1914; died April 25th, 1921.
DAVIS, WILLIAM JAMES. Elected Associate Member, August 31st, 1915; died September 2d, 1921.

Total Membership of the Society, October 4th, 1921,

10 205.

MONTHLY LIST OF RECENT ENGINEERING ARTICLES OF INTEREST

(September 1st to October 1st, 1921)

NOTE.—This list is published for the purpose of placing before the members of this Society the titles of current engineering articles, which can be referred to in any available engineering library, or can be procured by addressing the publication directly, the address and price being given wherever possible.

LIST OF PUBLICATIONS

In the subjoined list of articles, references are given by the number prefixed to each journal in this list.

- (2) *Journal*, Engrs. Club of Phila., Philadelphia, Pa.
- (3) *Journal*, Franklin Inst., Philadelphia, Pa., 50c.
- (4) *Journal*, Western Soc. of Engrs., Chicago, Ill., 50c.
- (5) *Journal*, Eng. Inst. of Canada, Montreal, Que., Canada.
- (6) *Journal*, Am. Inst. of Archts., Washington, D. C., 50c.
- (7) *Gesundheits Ingenieur*, Munich, Germany.
- (8) *Stevens Indicator*, Hoboken, N. J., 50c.
- (9) *Industrial Management*, New York City, 25c.
- (11) *Engineering* (London), W. H. Wiley, 432 Fourth Ave., New York City, 25c.
- (12) *The Engineer* (London), International News Co., New York City, 35c.
- (13) *Engineering News-Record*, New York City, 25c.
- (15) *Railway Age*, New York City, 15c.
- (16) *Engineering and Mining Journal*, New York City, 15c.
- (17) *Electric Railway Journal*, New York City, 10c.
- (18) *Railway Review*, Chicago, Ill., 15c.
- (19) *Scientific American Monthly*, New York City, 10c.
- (20) *Iron Age*, New York City, 20c.
- (21) *Railway Engineer*, London, England, 1s. 2d.
- (22) *Iron and Coal Trades Review*, London, England, 6d.
- (24) *American Gas Journal*, New York City, 10c.
- (25) *Railway Mechanical Engineer*, New York City, 20c.
- (26) *Electrical Review*, London, England, 4d.
- (27) *Electrical World*, New York City, 10c.
- (28) *Journal*, New England Water-Works Assoc., Boston, Mass., \$1.
- (29) *Journal*, Royal Soc. of Arts, London, England, 6d.
- (30) *Annales des Travaux Publics de Belgique*, Brussels, Belgium.
- (31) *Annales de l'Assoc. des Ingénieurs Sortis des Ecoles Spéciales de Gand*, Brussels, Belgium.
- (32) *Mémoires et Compte Rendu des Travaux*, Soc. Ing. Civ. de France, Paris, France.
- (33) *Le Génie Civil*, Paris, France, 1 fr.
- (36) *Cornell Civil Engineer*, Ithaca, N. Y.
- (40) *Zentralblatt der Bauverwaltung*, Berlin, Germany, 60 pfd.
- (41) *Elektrotechnische Zeitschrift*, Berlin, Germany.
- (42) *Journal*, Am. Inst. Elec. Engrs., New York City, \$1.
- (43) *Annales des Ponts et Chausées*, Paris, France.
- (45) *Coal Age*, New York City, 15c.
- (46) *Scientific American*, New York City, 15c.
- (47) *Mechanical Engineer*, Manchester, England, 3d.
- (48) *Zeitschrift*, Verein Deutscher Ingenieure, Berlin, Germany.
- (49) *Zeitschrift für Bauwesen*, Berlin, Germany.
- (50) *Stahl und Eisen*, Düsseldorf, Germany.
- (53) *Zeitschrift*, Oesterreichischer Ingenieur und Architekten-Verein, Vienna, Austria, 70h.
- (54) *Transactions*, Am. Soc. C. E., New York City, \$16.
- (55) *Mechanical Engineering*: Journal, Am. Soc. M. E., New York City, 35c.
- (56) *Transactions*, Am. Inst. Min. and Metallurgical Engrs., New York City, \$6.
- (57) *Collier's Guardian*, London, England, 5d.
- (58) *Proceedings*, Engrs' Soc. of W. Pa., 2511 Oliver Bldg., Pittsburgh, Pa., 50c.
- (59) *Proceedings*, American Water Works Assoc., Troy, N. Y.
- (60) *Municipal and County Engineering*, Indianapolis, Ind., 25c.
- (61) *Proceedings*, Western Railway Club, 225 Dearborn St., Chicago, Ill., 25c.
- (62) *Forging and Heat Treating*, Thaw Bldg., Pittsburgh, Pa., 10c.
- (63) *Minutes of Proceedings*, Inst. C. E., London, England.
- (64) *Power*, New York City, 10c.
- (65) *Official Proceedings*, New York Railroad Club, Brooklyn, N. Y., 15c.
- (67) *Cement and Engineering News*, Chicago, Ill., 25c.
- (69) *Eisenbau*, Leipzig, Germany.
- (71) *Journal*, Iron and Steel Inst., London, England.
- (71a) *Carnegie Scholarship Memoirs*, Iron and Steel Inst., London, England.
- (72) *American Machinist*, New York City, 15c.
- (73) *Electrician*, London, England, 1s.
- (75) *Proceedings*, Inst. of Mech. Engrs., London, England.
- (77) *Journal*, Inst. Elec. Engrs., London, England, 5s.
- (78) *Beton und Eisen*, Vienna, Austria.
- (80) *Tonindustrie Zeitung*, Berlin, Germany.
- (83) *Gas Age-Record*, New York City, 15c.

(85) *Proceedings*, Am. Ry. Eng. Assoc., Chicago, Ill. (106) *Transactions*, Inst. of Min. Engrs., London, England, 6s.

(86) *Engineering and Contracting*, Chicago, Ill., 10c. (107) *Schweizerische Bauzeitung*, Zürich, Switzerland.

(87) *Railway Maintenance Engineer*, Chicago, Ill., 10c. (109) *Journal*, Boston Soc. C. E., Boston, Mass., 50c.

(88) *Bulletin of the International Ry. Congress Assoc.*, Brussels, Belgium. (111) *Journal of Electricity*, San Francisco, Cal., 25c.

(89) *Proceedings*, Am. Soc. for Testing Materials, Philadelphia, Pa., \$5. (113) *Proceedings*, Am. Wood Preservers' Assoc., Baltimore, Md.

(90) *Transactions*, Inst. of Naval Archts., London, England. (114) *Journal*, Institution of Municipal and County Engineers, London, England, 1s. 6d.

(91) *Transactions*, Soc. of Naval Archts. and Marine Engrs., New York City. (115) *Journal*, Engrs. Club of St. Louis, St. Louis, Mo., 35c.

(92) *Bulletin*, Soc. d'Encouragement pour l'Industrie Nationale, Paris, France. (116) *Blast Furnace and Steel Plant*, Pittsburgh, Pa., 15c.

(96) *Canadian Engineer*, Toronto, Ont., Canada, 10c. (117) *Engineering World*, Chicago, Ill.

(98) *Journal*, Engrs. Soc. of Pa., Harrisburg, Pa., 30c. (118) *Times Engineering Supplement*, London, England, 2d.

(99) *Proceedings*, Am. Soc. of Municipal Improvements, New York City, \$2. (119) *Landscape Architecture*, Harrisburg, Pa., 50c.

(100) *Military Engineer*: Journal of the Society of American Military Engineers, Washington, D. C., 75c. (120) *Automotive Industries*, New York City, 15c.

(103) *Mining and Scientific Press*, San Francisco, Cal., 10c. (121) *Proceedings*, Am. Concrete Inst., Boston, Mass.

(105) *Chemical and Metallurgical Engineering*, New York City, 25c. (122) *The Dock and Harbour Authority*, London, England, 1s. 6d.

LIST OF ARTICLES

Bridges.

Economy of Concrete Bridges Established by 10 Years' Record.* B. J. Garnett. (117) Sept.

Pontoon Bridge Across the Hudson River. George A. Post. (117) Sept.

Tests on Railroad Bridges in Respect of Impact Effect.* Conrad Gribble. (21) Sept.

Suggested Method of Representing Live Loads on Bridges.* Henry E. Stratton. (21) Sept.

Huerfana River Concrete Highway Bridge in Colorado.* Robert Dubois. (60) Sept.

Susitna River Bridge, Alaska Railroad, U. S. A. (12) Sept. 9.

Concrete Arch Bridge of Three 250-Ft. Spans.* E. H. Harder. (13) Sept. 22.

A Bridge Building Record.* E. W. Davidson. (46) Sept. 24.

Eight-Cable Suspension Bridge of 1803-Ft. Span for Detroit.* (13) Sept. 29.

The Development of Heavy Ponton Equipment for Increased Army Loads of the Future.* Theodore Wyman, Jr. (100) Sept.-Oct.

Construction d'un Pont Suspendu de 533m 40 de Portée sur la Delaware, à Philadelphie (E.-U.)* (Construction of a Suspension Bridge of 533.40m. span over the Delaware, at Philadelphia (U. S.)) (33) Aug. 27.

Electrical.

A Note on the Interconnected-Star Method of Connecting Three-Phase Transformer Windings.* S. Austen Stigant. (26) Serial beginning Aug. 26.

Partial Demagnetisation: Its Influence Upon the Permanency of Magnets.* Claudius Shenfer. (73) Aug. 26.

Skin Effect in Large Stranded Conductors at Low Frequencies.* W. I. Middleton and E. W. Davis. (42) Sept.

Tooth Frequency Losses in Rotating Machines.* Thomas Spooner. (42) Sept.

Re-establishing Service in a D-C. Edison System After an Interruption.* Raymond Bailey. (42) Sept.

The Magnetron.* Albert W. Hull. (42) Sept.

Direction-Finding Wireless.* J. J. Bennett. (11) Sept. 2.

Arc Rupture in Magnetic Blow-Out Switches.* O. H. Eschholz. (73) Sept. 3.

The Heating of Cables. P. Dunsheath. (73) Sept. 9.

The Circle Diagram for Closed Slots.* H. K. Whitehorn. (73) Sept. 16.

110-Kv. Transmission Line on Wood Poles.* L. J. Moore. (27) Sept. 24.

Le Moteur Synchrone d'Induction des Ateliers de Construction d'Oerlikon (Suisse). (The Synchronous Induction Motor of the Oerlikon Construction Works (Switzerland).) (33) Aug. 13.

Das Fernsprechwesen mit Wählerbetrieb.* (Telephone with Selective Calls.) M. Guttzeit. (48) June 11.

Zur Frage der Ausfuhr elektrischer Energie. (On the Question of the Exportation of Electrical Energy.) (107) June 25.

Ein "Synchron-Induktionsmotor."* (A "Synchronous Induction Motor".) A. Hoeffleur. (107) July 2.

Neue elektrische Fern-Feuchtigkeitsmesser.* (A New Electric Long-Distance Hydrometer.) Josef Cartus. (48) July 16.

Marine.

The Effect of Appendages in Ship Resistance.* (12) Aug. 26.

Electricity Applied to Ship Auxiliaries.* H. L. Hibbard. (42) Sept.

Turbine Reduction Gears versus Electric Propulsion for Ships.* Eskil Berg. (42) Sept.

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Gearing for Ship Propulsion.* (118) Sept.
 Condensing Plant in Ships. (118) Sept.
 Angular Vibrations in Marine Propelling Machinery.* Richard Gardner. (11) Sept. 9.
 Stresses in Ship's Plating Due to Fluid Pressure.* Bernard C. Laws. (Paper read before British Assoc. of Edinburgh.) (11) Sept. 9.

Mechanical.

Oxygen Content of Coals.* (From Final Report of the Spontaneous Combustion Comm., Min. Inst. of Scotland.) (57) Aug. 19.
 Elongation and Gauge Length in Tensile Tests.* J. H. G. Monypenny. (12) Aug. 26.
 The Internal Bracing of Aeroplane Wings.* A. H. Stuart. (11) Aug. 26.
 The Use of Oil in Cleaning Coal. (57) Aug. 26.
 Increasing Water-Gas Set Capacity. J. Hawley Taussig. (Paper read before Southern Gas Assoc.) (83) Sept.
 Water Treatment for Boilers.* Julian S. Simsohn. (55) Sept.
 The Absorption of Gasoline from Casinghead Gas by Activated Charcoal.* H. R. Auerswald. (55) Sept.
 Efficient Operation of Oil-Burning Steam Plants.* C. H. Delany. (55) Sept.
 Die Sinking and Metal Patternmaking by Automatic Machine.* Joseph F. Keller. (55) Sept.
 Variable-Speed Motors in Finishing Plants. Warren B. Lewis. (55) Sept.
 Power-Plant Evolution.* C. F. Hirshfeld. (55) Sept.
 New Wet Process Plant of the Oklahoma Portland Cement Co. (67) Sept.
 High Altitude Aircraft of the Future.* C. Eberhardt. (120) Sept. 1. (Translated from *Der Motorwagen*.)
 The Allocation of Boiler-House Working Costs in Reducing Steam-Engine Plants.* T. E. Houghton. (26) Sept. 2.
 Sulphur Removal by Oil Washing.* E. R. Hamilton. (From paper read before Canadian Gas Assoc.) (83) Sept. 3.
 The Installation of Oil as Fuel.* Allen F. Brewer. (64) Sept. 6.
 Safety Precautions in the Operation of Large Turbines.* (64) Sept. 6.
 New Ford Power Plant at River Rouge.* Thomas Wilson. (64) Sept. 6.
 Producer Gas as a Fuel for Automotive Vehicles.* P. M. Heldt. (120) Serial beginning Sept. 8.
 A New Design of High Speed Engine Indicator.* Benno R. Dierfeld. (120) Sept. 8.
 Novel Condenser Pump House.* (17) Sept. 10.
 Activated Carbon Converts H₂S into S.* A. Englehardt. (83) Sept. 10.
 Louisville's Mammoth Pumping Engine.* (64) Sept. 13.
 The Use of Inert Gas for the Prevention of Explosions.* Edward F. White. (105) Sept. 14.
 Briquetting Mineral Phosphates.* William H. Waggaman, H. W. Easterwood and T. B. Turley. (105) Sept. 14.
 A Laboratory for Aircraft Engine Testing.* Herbert Chase. (120) Sept. 15.
 Gear Calculations by the Compressive Stress Method.* Joseph Jandasek. (120) Serial beginning Sept. 15.
 Experimental Comparison of a Preheated Air Furnace With a Direct Fired Furnace.* O. Lellep. (24) Sept. 17.
 Acme Power Plant at Toledo.* (64) Sept. 20.
 Problems in Parallel Operation of Compound Generators.* Eutis H. Thompson. (64) Sept. 20.
 Welding; Particularly Hammer Welding.* Ernest Edgar Thum. (105) Sept. 21.
 Springing and Other Refinements in Motorcycle Design.* G. H. Savage. (Extracts from paper read before Inst. Automobile Engrs.) (120) Sept. 22.
 Safety Factors in Airplane Design. Alfred S. Niles. (13) Sept. 22.
 Heat Efficiency of Less Rich Gas. Wilhelm Bertelsmann. (From *Das Gas u. Wasserfach*.) (83) Sept. 24.
 Internal-Combustion Engines.* Charles E. Lucke. (64) Sept. 27.
 Fulton Market Cold Storage Plant, Chicago.* (64) Sept. 27.
 Largest Boiler to Supply Steam for Heating.* J. H. Walker. (64) Sept. 27.
 L'Etat Actuel et L'Avenir de l'Industrie Gazière, La Récupération du Benzol.* (The Present and Future of the Gas Industry, Benzol Recovery.) A. Grebel. (92) June.
 Le Contrôle de la Chauffe les Appareils de Mesure Servant à ce Contrôle. (The Control of Heating: Measuring Apparatus Serving for this Control.) Paul Frion. (92) June.
 Les Moteurs à Gaz et Machines Soufflantes de Grande Puissance, Système Galloway.* (High Power Gas Engines and Blowing Engines, Galloway System.) (33) Aug. 13.
 L'Avion Monoplan *Staaken* de 1 000 Chevaux des Chantiers Zeppelin.* (The 1 000 Horse-power Monoplane *Staaken* from the Zeppelin Shops.) (33) Aug. 20.
 Drahtseilbahnen neuester Zeit.* (Cableways of the Latest Type.) Kamillo Flat. (53) Apr. 29.
 Transportkrane. (Transport Cranes.) Hans Fischer. (53) Serial beginning Apr. 29.
 Lokomotive-Drehkran. (Locomotive Slewing Crane.) Josef Kartin. (53) Apr. 29.
 Werkstättenkrane für Grossmaschinenbau.* (Shop Cranes for Large Machine Construction.) Ernst Schwarz. (53) Serial beginning Apr. 29.
 Neue Verlade- und Fördereinrichtungen auf den Kohlen- und Holzplätzen der Gemeinde Wien.* (New Unloading and Conveying Arrangements in the Coal and Lumber Yards in Vienna.) R. Brabée. (53) Apr. 29.
 Elektrische Stirnkipper für Gas- und Elektrizitätswerke.* (Electric Front Tippers for Gas and Electric Works.) (53) Serial beginning Apr. 29.
 Das 1 000 PS Verkehrsflugzeug der Zeppelinwerke in Staaken.* (The 1 000 H. P. Commercial Flying Machine of the Zeppelin Works in Staaken.) K. Rohrbach. (48) June 4.
 Der Wärmeübergang bei Flüssigkeiten und Gasen als Funktion der Geschwindigkeit. (Heat Transmission in Liquids and Gases as a Function of Velocity.) H. Preussler. (50) June 16.

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Neuere Feinmessgeräte für die technische Längenbestimmung.* (Modern Precision Instruments for Length Determinations for Technical Purposes.) G. Berndt. (48) June 18. Untersuchungen an einer Ammoniak-Kältemaschine.* (Investigations Regarding Ammonia Refrigerating Machine.) Walther Fischer. (48) July 2. Anwendbarkeit der Kohlenstaubfeuerung in Eisenhüttenwerken.* (Use of Coal Dust Firing in Iron Smelting Plants.) G. Bulle. (50) July 21. Zeugdruck.* (Cloth Printing.) Schreckenbach. (48) July 23.

Metallurgical.

Blast-Furnace Plant of the St. Louis Coke and Chemical Company.* (22) Aug. 26. Review of Cost of Rolling Steel in Various Mills.* G. E. Stoltz. (2) Sept. The Friction Coefficient of Minerals.* Stanley Nettleton. (Paper read before Midland Inst. of Min., Civil and Mech. Engrs.) (57) Sept. 2; (22) Sept. 2. Electric Furnaces for Silver, Gold and Metals of Low Melting Point.* Jonas Herlenius. (105) Sept. 7. Electric Furnace Operating Experiences.* Larry J. Barton. (20) Sept. 8. Foundry Irons for Particular Uses.* Y. A. Dyer. (15) Sept. 8. Three Types of Alloy Sheet Steel.* Horace C. Kneer. (20) Serial beginning Sept. 8. The Influence of the Width of the Specimen Upon the Results of Tensile Tests of Mild Steel and Rolled Copper.* T. Hudson Beare and William Gordon. (Paper read before British Assoc.) (11) Sept. 9. Melting Fine and Sterling Silver by Electricity. H. A. De Fries. (105) Sept. 14. A Discussion of the Slip Interference Theory of Hardening. Albert Sauveur. (105) Sept. 14. Characteristics of the Forged Milling Cutter.* William G. Calkins. (72) Sept. 15. Effect of Heat-Treatment on Steel Castings and Drop Forgings.* A. A. Blue. (72) Sept. 15. New Trumbull-Cliffs 600-Ton Blast Furnace.* (20) Sept. 15. Recent Applications of the Cottrell Processes.* R. B. Hesson, P. E. Laudolt and A. A. Heimrod. (16) Sept. 17. Special Features of Blast Furnace Plant.* (13) Sept. 22. Calculation of Equilibrium in Metallurgical Reactions. Paul D. Merica. (105) Sept. 28. The Constitution of Martensite and Troostite. D. J. McAdam, Jr. (105) Sept. 28. La Protection des Métaux par la Calorisation.* (Protection of Metals by "Calorization.") (33) Aug. 6. Beitrag zur Kenntnis des Elektrolyteisens.* (Contribution to the Knowledge of Electrolytic Iron.) O. Bauer and W. Schneider. (50) May 12. Die Entphosphorung des Ilseider Thomasrohreisens im Konverter und im Martinofen.* (Dephosphorization of Ilseid Basic Pig Iron in the Converter and the Openhearth Furnace.) Arthur Jung. (50) May 19. Schmiedeversuche an Flusseisen.* (Forging Experiments on Ingot Iron.) Paul Junkers. (50) May 19. Beiträge zur Frage der Verhüttung fricktalischer Eisenerze. Alfred Redlich. (Contributions to the Question of the Smelting of Fricktal Iron Ores.) (107) May 28. Ueber die Metallurgie des Elektrohochofens.* (On the Metallurgy of the Electric Blast Furnace.) R. Durrer. (50) June 2. Das Verhalten des Schwefels in der Thomasbirne.* (The Behavior of Sulphur in the Thomas Converter.) E. Herzog. (50) June 9. Ueber den Einfluss dcr Fremdkörper im Flusseisen auf seine Schweissbarkeit in der Schmelzflamme.* (On the Effect of Foreign Substances in Ingot Metal on Its Welding Properties in a Fusion Flame.) C. Diegel. (48) June 11. Luftverhältnisse in Hüttenanlagen und Billige Beschaffungsmöglichkeit trockener Luft.* (Air Conditions in Metallurgical Plants and the Possibility for Procuring Cheap Dry Air.) J. Brown. (50) June 16. Schwefelgewinnung aus Hochofenschlacke. (Production of Sulphur from Blast Furnace Slag.) L. H. Diehl. (50) June 23. Beiträge zur Erhöhung der Ammoniakausbeute bei der Destillation der Steinkohle.* (Notes on the Increase of the Yield of Ammonia in the Distillation of Coal.) Friedrich Sommer. (50) June 23. Anwendbarkeit der Kohlenstaubfeuerung in Eisenhüttenwerken.* (Use of Coal Dust Firing in Iron Smelting Plants.) G. Bulle. (50) July 21. Beiträge zur Kenntnis des Kuppelofenbetriebes.* (Contribution to the Knowledge of Cupola Operation.) Fritz Braun and Georg Hollender. (50) July 28. Die Beheizung von Martinöfen mit einem Gemisch von Braunkohlenbrikett- und Hochofengas.* (Heating Open-Hearth Furnaces with a Mixture of Lignite Briquettes and Blast-Furnace Gas.) Fritz Boettcher. (50) July 28. Kraftwirkungsfiguren in Flusseisen, dargestellt durch ein neues Aetzverfahren.* (Etched Figures Showing the Effect of Forces in Ingot Iron, Produced by a New Method.) Ad Fry. (50) Aug. 11. Ueber Gichtgasvergiftungen. (On Furnace Gas Poisoning.) Otto Johannsen. (50) Aug. 18. Rissbildung in Kesselblechen.* (Formation of Cracks in Boiler Plates.) B. Strauss and Ad Fry. (50) Aug. 18.

Mining.

Characteristics of Outbursts of Gas in Mines.* Henry Briggs. (106) Aug. New Method of Measuring Ventilating Resistances. (From paper read before Min. Inst. of Scotland.) (57) Aug. 19. Shaft Sinking Through Quicksand Under Heavy Pressure by Freezing Process.* L. Sanvester. (From *Annales des Mines de Belgique*.) (86) Aug. 31. Jubilee Steel Bankhead at Sydney Mines Will Introduce Many Innovations in That Type of Structure.* A. Dawes. (From paper read before Min. Soc. of Nova Scotia, Halifax.) (45) Sept. 1.

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Steel Mine Car Designed to Suit Anthracite Conditions.* Dever C. Ashmead. (45) Sept. 1.
 Pumping Fluctuations in Unwatering a French Colliery. M. Leca. (From *Revue de l'Industrie Minérale*.) (57) Serial beginning Sept. 9.
 A Problem in Levels.* J. F. Springer. (46) Sept. 17.
 The Magnetometer as an Aid in the Development of Mines.* Arthur Gibson. (103) Sept. 24.
 Le Plan d'Aménagement de Casablanca (Maroc).* (The Re-Layout of the City of Casablanca (Morocco).) E. Joyant. (33) Aug. 20.

Miscellaneous.

The True Factors for Measurement of Depreciation.* W. W. Pollock. (2) Sept.
 Report on Elimination of Waste in Industry. (55) Sept.
 Appraising the Diesel Engine Plant.* Allen F. Brewer. (9) Sept.
 The Scientific Location of Manufacturing Plants.* J. George Frederick. (9) Sept. 1.
 Developing an Industrial Plant Layout.* A. T. Doud. (9) Sept. 1.
 Die psychotechnische Eignungsprüfung und ihre Anwendung auf Hüttenbetriebe. (Psychotechnical Qualification Testing and Its Use in Metallurgical Works.) (50) June 16.

Municipal.

Die städtebaulichen Probleme von Gross-Paris.* (Municipal Construction Problems of Greater Paris.) Nils Hammarstrand. (53) Serial beginning May 28.

Railroads.

Rail Calculations.* M. R. Desprets. (88) Aug.
 On the Question of Special Steels.* Mr. Sand. (88) Aug.
 On the Question of Slow-Freight Traffic.* W. H. Williams. (88) Aug.
 On the Question of the Construction of the Road Bed and of the Track.* E. F. C. Trench. (88) Aug.
 On the Question of the Maintenance and the Supervision of the Track.* Earl Stimson. (88) Aug.
 On the Utility of Studying the Question of the Use of Liquid Fuel in Locomotives.* Henry Fowler. (88) Aug.
 Developing a Water Supply Plant of Large Capacity.* (For Engine Terminal.) (87) Sept.
 Should Ties Be Spaced When Relaying Rail? W. F. Rensch. (87) Sept.
 Insulation of Passenger and Refrigerator Cars.* Arthur J. Wood. (25) Sept.
 The Comparison of Dimensions and Proportions of British Locomotives.* E. C. Poultnay. (25) Sept.
 Tests on Railway Bridges in Respect of Impact Effect.* Conrad Gribble. (21) Sept.
 A Large Capacity Locomotive Weighing Plant.* Carl C. Bailey. (15) Sept. 3.
 Booster Tests on Temiskaming & Northern Ontario.* (15) Sept. 3.
 Electrification Progress on Italian Railways.* Giovanni B. Santi. (15) Sept. 3.
 Controlling Refrigerator Car Temperature in Winter Months.* (18) Sept. 3.
 Operate Locomotive 7 800 Miles Without Dumping Fire.* (18) Sept. 10.
 Automatic Cut-Off Control by Back Pressure *versus* Speed.* E. S. Pearce. (18) Sept. 10.
 Virginian Builds Double Track to Relieve Congestion.* (15) Sept. 10.
 New Locomotives for the Missouri Pacific.* (15) Sept. 10.
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 Oklahoma Engine Terminal and Line Revision; M., K. & T. Ry.* (13) Sept. 15.
 Lining the Canadian Pacific's Five-Mile Tunnel. (15) Sept. 17.
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 D. and S. L. Presents Difficult Operating Problem.* (18) Sept. 17.
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 Classification and Distribution of Second-Hand Rail. (Comm. report, Roadmasters and Maintenance of Way Assoc.) (18) Sept. 24.
 Save Money in Consolidation of Locomotive Terminals.* (18) Sept. 24.
 100-Ton Coal Cars for the Chesapeake & Ohio.* (15) Sept. 24.
 Nouveau Système de Transmission de Mouvement entre les Moteurs et les Essieux des Locomotives Électriques.* (A New System for Transmitting Motion Between the Motors and Axles of Electric Locomotives.) M. Auvert. (38) Aug.
 Conditions d'Emploi des Charbons dans les Chemins de Fer Français. (Conditions as to the Use of Coal on the French Railways.) M. de Boysson. (38) Aug.
 Kohlenverbrauch und Wirtschaftlichkeit des Dampflokomotiven. (Coal Consumption and Economy of the Steam Locomotive.) Karl Schlöss. (53) Mar. 25.
 Über den Fortgang der Arbeiten zur Elektrisierung unserer Staatsbahnen.* (On the Development of the Work of the Electrification of Our State Railroads.) Paul Dittes. (53) Apr. 15.
 Untersuchungen über die Beeinflussung von Schwachstromleitungen durch die elektrische Mittenwaldbahn. (Investigations as to the Interference Suffered by Low Current Transmission Wires from the Electric Mittenwald Railroad.) Leo Truxa. (53) May 28.
 Die Einphasen-Wechselstrombahn St. Pölten-Marizell.* (The St. Pölten-Marizell Single Phase Alternating Current Railway.) (53) May 28.
 Ventilsteuerung für Dampflokomotiven.* (Valve Gear for Steam Locomotives.) Wittfeld. (48) June 11.
 Entwicklungsmöglichkeiten der elektrischen Vollbahnlokomotive.* (Development Possibilities for Electric Standard Gage Locomotives.) Egon E. Seefehner. (107) Serial beginning July 9.
 Über Schüttelerscheinungen des Parallelkurbelgetriebes elektrischer Lokomotiven.* (On Oscillation Phenomena in Parallel Drive Electric Locomotives.) (107) Aug. 6.

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Zur Genfer Bahnhoffrage.* (On the Question of the Geneva Railway Station.) (107)
Serial beginning Aug. 13.
Die Neuen Lokomotiven der Staatsbahnen auf Sumatra (Westküste).* (The New Locomotives of the Sumatra State Railway (West Coast).) Siegfried Abt. (107) Aug. 13.

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Automatic Train Registering.* A. A. Roberts. (17) Sept. 17.
Control Trailers Used in Washington.* (17) Sept. 17.
The Bus Transportation Field.* C. W. Stocks. (17) Sept. 24.
Die Wiener Strassenbahn im Kriege und in der Nachkriegszeit.* (The Vienna Street Railway During and After the War.) A. Winter. (53) May 28.

Roads and Pavements.

Determination of Bearing Power of Soil Under Repeating Loads.* H. F. Clemer. (117) Sept.
Report of Calgary Committee on Deterioration of Concrete in Alkali Soils. (Eng. Inst. Canada.) (5) Sept.
Report of Committee on Standard Specifications for Highways.* (Eng. Inst. Canada.) H. S. Carpenter. (5) Sept.
Protecting Pavements on Car Track Streets.* H. A. Nunlist. (60) Sept.
Nebraska Uses Industrial Railway in Construction of Gravel Roads.* George E. Johnson. (60) Sept.
Special Method of Handling "Second Story" Construction Work on State Highway in Los Angeles County, California.* W. W. Patch. (60) Sept.
Construction of Penetration and Mixed Macadam Roads. E. J. Wulff. (96) Serial beginning Sept. 1.
The Traffic Census and Its Use in Deciding Road Width.* A. N. Johnson. (From paper read before Yale University.) (86) Sept. 7.
Features of Brick Pavement Designs for Highways. Jas. C. Travilla. (Abstract of paper read before Kentucky State and County Road Engrs.) (86) Sept. 7.
Methods and Cost of Municipal Asphalt Plant Operations at Chatham, Ont. C. H. R. Fuller. (From *Contract Record*.) (86) Sept. 7.
U. S. Bureau of Public Roads Tests for Soils with Relation to Their Use in the Subgrade of Highways.* (86) Sept. 7.
Pave 70-Ft. Boulevard with Sheet Asphalt.* (13) Sept. 8.
Notes on Road Maintenance. E. H. Colcutt. (114) Sept. 10.
Locating Highway Grades in Steep Side-Hill Country.* George A. Tilton. (13) Sept. 15.
Open-Hearth Furnace Design.* A. D. Williams. (20) Sept. 22.
Dirt Roads Treated with Steam Ashes and Cold Road Oil. Fred. H. Shepheard and E. E. Butterfield. (13) Sept. 22.
Street Car Tracks Paved with Grouted Concrete.* (13) Sept. 29.

Sanitation.

Experimental Work on Sewage Disposal at Sheffield.* John Haworth and F. W. Hodgkinson. (114) Aug. 27.
Surface Purification of Sewage.* W. D. Scouller. (86) Aug. 31.
Use of Lime in Sewage Treatment.* M. E. Holmes. (117) Sept.
Modifications of Imhoff Tanks. E. A. Stewart. (60) Sept.
Sludge Process Developments. Harrison P. Eddy. (96) Serial beginning Sept. 1.
The Cost of Anti-Malaria Work in Port Arthur, Texas.* R. G. Upton. (13) Sept. 8.
The Blue River Sewerage Problem, Kansas City, Mo.* (13) Sept. 15.
Colloids and Sewage Disposal. F. W. Mohlman and Langdon Pearse. (96) Sept. 22.
Practical Economics of Dredge Pump Design. E. J. Dent. (13) Sept. 29.
Indianola Pumps Water from Allegheny River Wells and Treats Its Sewage by Bacteria and Chlorination.* Alphonse F. Brosky. (105) Sept. 29.

Structural.

Pneumatic Grain-Discharging and Sack-Handling at Bordeaux.* (11) Aug. 26.
Report of Manitoba Committee on Deterioration of Concrete in Alkali Soils. (Eng. Inst. Canada.) (5) Sept.
Why Concrete is the Master Building Material in Philippines.* J. C. Witt. (117) Sept.
Variation in the Effect of Rodding Concrete.* F. E. Giesecke. (117) Sept.
Overcoming Subsoil Troubles on a Construction Job.* V. D. Green. (117) Sept.
Using 1 1/4-In. Plank for Flat Slab Floor Forms.* J. E. Gurvin. (13) Sept. 8.
Special Structural Design for Newspaper Building.* (13) Sept. 8.
Experiments on the Mechanical Properties of Scots Pine.* Alex. R. Horne. (Paper read before British Assoc.) (11) Sept. 9.
Fire Causes and Prevention. (24) Sept. 10.
Form Settlement Causes Concrete Building Collapse.* (13) Sept. 15.
New Laboratory Abrasion Test for Concrete.* C. H. Scholer. (13) Sept. 22.
Liberty Tunnels Driven by Full-Section Excavation. (13) Sept. 22.
Some Examples of Corrosion of Reinforcing Steel.* Frank P. McKibben. (13) Sept. 29.
Pronounced Reinforcement Corrosion Due to Sea Water or Electrolysis.* Welton C. Snow. (13) Sept. 29.
Concrete T-Beam Diagram Permits Direct Designing and Checking.* A. U. Karpof and U. T. Givotovsky. (13) Sept. 29.
To Spring a Groined Arch between High Column and Low Walls.* Perry Thompson. (13) Sept. 29.
Le Calcul des Portiques Continus.* (Calculation of Continuous Beams.) Benabenq. (33) Serial beginning Aug. 20.
Hochkamin- und Wasserturm des Wernerwerkes in Siemensstadt.* (The Werner Plant's High Chimney and Water Tower in Siemens City.) G. Quaink. (107) June 4.

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Das Münster in Bern.* (The Cathedral in Bern.) Karl InderMühle. (107) Serial beginning July 2.
 Ueber moderne Holzbauweisen.* (On Modern Methods of Wood Construction.) Hugo Ritter. (107) Serial beginning July 30.
 Die amerikanische Zementkanone und ihr Anwendungsbereich.* (The American Cement Gun and Its Field of Use.) K. E. Hilgard. (107) Serial beginning Aug. 20.

Topographical.

Progress in City Planning in the United States.* Jacob L. Crane, Jr. (13) Sept. 29.
 Some Notes in Running Land Lines.* F. Ernest Brackett. (13) Sept. 29.

Water Supply.

Water-Power Developments in North Wales.* John B. C. Kershaw. (12) Aug. 26.
 Water Filtration in Madras. James Welby Madeley. (From 1920 *Proceedings, Inst. of Water Engrs.*) (86) Aug. 31.
 The Construction of Water-works on Land Subject to Subsidence.* F. C. Cook and R. C. Moon. (From 1920 *Proceedings, Inst. of Water Engrs.*) (86) Aug. 31.
 Problems in Utilization of Water for Production of Power.* W. J. E. Binnie. (From *The Surveyor.*) (86) Aug. 31.
 Immense Irrigation and Other Projects of the Northwest.* W. A. Scott. (117) Sept.
 Repairing and Waterproofing of a Concrete Reservoir by Gunite.* Barclay A. Greene. (117) Sept.
 World's Greatest Electrical Project. Charles Heston Peirson. (117) Sept.
 Wilson Dam and Muscle Shoals.* (67) Sept.
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 Using Electrically Operated Valves at Buffalo, N. Y., and Cambridge, Mass.* (60) Sept.
 Suggestions on the Design of Tile Drainage Systems. J. W. Dappert. (Paper read before Illinois Soc. of Engrs.) (60) Serial beginning Sept.
 An Improved Type of Filter Press.* Charles D. Burchenal. (105) Sept. 7.
 Use of Photography in Hydraulic Measurements in India.* S. C. Majumdar. (13) Sept. 8.
 Mechanical Filtration Plant Being Built in Cambridge. George A. Johnson. (13) Sept. 8.
 Underground Water Supply for an Akron Rubber Plant. Frederick L. Roache. (13) Sept. 8.
 Ground Water Control on Drainage Project in Florida.* F. Telchman. (13) Sept. 8.
 Repairing Wood Water Conduit at Norfolk, Virginia.* J. W. Ledoux. (13) Sept. 8.
 Problems in the Chlorination of Water.* (13) Serial beginning Sept. 8.
 Quick and Economical Waterwheel Test.* R. C. Starr. (27) Sept. 10.
 Overhauling a Neglected Water Distribution System. A. S. Holway. (Paper read before Southwest Waterworks Assoc.) (86) Sept. 14.
 Apparatus and Chemicals for a Small Water Works Laboratory. (86) Sept. 14.
 Future Water Power Development Problems of the West.* F. G. Baum. (111) Sept. 15.
 Water Power Development. A. H. Gibson. (Abstract of paper read before British Assoc.) (73) Sept. 16.
 Operating Cost of 40 Drag Line Excavators on U. S. Reclamation Projects.* (From *Reclamation Record.*) (86) Sept. 21.
 B. Welch, Gastro-Enteritis and Water Supply. Alexander Houston. (13) Sept. 22.
 A New River Planned for Flood Protection and Drainage.* (13) Sept. 22.
 Effect of Curvature Upon Flow in Open Channels.* Harrison P. Eddy. (13) Sept. 29.
 Utilisation de l'Energie des Marées. (Utilization of Tidal Power.) M. Boisnier. (43) May-June.
 Les usines, hydro-électriques du Guadiaro.* (The Guadiaro Hydroelectric Plants.) Adolphe Weber. (107) Serial beginning June 4.
 Die Wasserkraftanlage von Fully (Schweiz).* (The Fully (Switzerland) Hydraulic Works.) H. Fernau. (53) June 24.
 Vergangenes und Künftiges von Talsperren, ein Beitrag zur Ausnutzung unserer Wasserkräfte. (Past and Future of Barrage Dams, a Contribution to the Utilization of Our Water Powers.) Merlecek. (53) June 24.
 Die Bauten für die Kraftwerke Oberhasle gemäss den Projekten der B. K. W.* (Constructions for the Oberhasle Power Plant According to the Plans of the Bern Power Works Stock Company.) (107) Serial beginning July 2.*
 Die Wasserkraftwerke am Rjukanfoss und am Glomfjord in Norwegen.* (The Water Power Plants at Rjukanfoss and at Glomfjord in Norway.) (Gg v. Troeltsch. (48) July 2.
 Das Chippawa-Queenston-Kraftwerk am Niagara der Hydro-Electric Power Commission of Ontario.* (The Chippawa-Queenston Power Plant on the Niagara, of the Hydro-Electric Power Commission of Ontario.) Ernst Steiner. (107) July 16.
 Stauwerke für Kraftwirtschaft, Schiffahrt und Landeskultur.* (Barrage Dams for Power Plants, Navigation and Agriculture.) E. Mattern. (48) Serial beginning July 23.
 Theoretische Erörterungen zur Wassermessmethode von N. R. Gibson.* (Theoretical Discussions on the N. R. Gibson Method of Measuring Water.) Robert Dubs. (107) July 23.

Waterways.

Lift Locks on the Canal du Centre, Belgium.* (From *Les Annales des Travaux Publics de Belgique.*) (12) Aug. 26.
 The Port of Philadelphia, U. S. A.* (122) Sept.
 Development of an East Anglian Harbour.* (122) Sept.
 Pier—Surface and Superstructure—Terminal Design.* H. McL. Harding. (117) Sept.
 Government Engineers Report on St. Lawrence Waterway.* Harrison G. Roby. (13) Sept. 8.
 Complete St. Lawrence Waterway Project Report.* W. A. Bowden and W. P. Wooten. (96) Serial beginning Sept. 15.
 Tidal Bore Studies on River Dee and Its Estuary.* William Gore. (13) Sept. 22.
 Wien und die Donau.* (Vienna and the Danube.) W. Hollitscher. (53) May 28.